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The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

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PUBLISHERS' ANNOUNCEMENT: REMOVAL OF THE OFFICES OF THE JOURNAL.

The proprietors of the JOURNAL herewith announce that on and after to-day the publishing offices will be located on the sixth floor of No. 42 Pine street, which building is just below the one occupied by the JOURNAL since 1891. The JOURNAL'S new quarters (in reality they are old ones, for its publishing offices were maintained in the building that formerly covered the site of 42 Pine street from May, 1870, to May, 1891) are in a modern structure that is located in the heart of the financial business section of the city, and can be reached easily by or from any of the main lines of public travel. A. M. CALLENDER & CO.

[OFFICIAL NOTICE.]

Twenty-Fifth Annual Meeting, Western Gas Association.

WESTERN GAS ASSOCIATION,
OFFICE OF THE SECRETARY,
NEW ALBANY, IND., April 7th, 1902.

The Twenty-fifth Annual Meeting of the Western Gas Association will be held May 21st, 22d and 23d, 1902, in the New St. Charles Hotel, New Orleans, La., and will be called to order, at 10 A.M., by the President, Mr. Thos. D. Miller, of Dallas, Tex.

The Executive Committee has arranged for the presentation of the following papers:

"Experiments on Bench Fuel;" by Mr. W. A. Baehr, Denver, Col.

"Gasholder Specifications;" by Mr. H. A. Carpenter, Allegheny, Pa.

"Electrolysis;" by Mr. Jno. M. Humiston, Chicago, Ills.

"Beaumont Oil for Gas Making;" by Mr. Jno. H. Fitzgerald, Houston, Tex.

"Some Experiences in New Orleans;" by Mr. Bankson Taylor, New Orleans, La.

"Gas Engines;" by Mr. C. H. Nutting, Chicopee, Mass.

"Distributing Gas at High Pressure;" by Mr. Geo. F. Goodnow, Waukegan, Ills.

"Current Purifier Practice, and a New Form of Construction;" by Mr. F. H. Shelton, Philadelphia, Pa.

"Wrinkle Department;" edited by Mr. W. E. Steinwedell, Belleville, Ills.

A paper by Mr. B. E. Chollar, St. Louis, Mo.

The New St. Charles will be the Association headquarters. Rates for those attending will be as follows:

American plan: Two in room, $2.50 per day, each person; $3 per day one in a room. Rooms with bath, $3.50 per day and up.

European plan: Two in a room, $1 per day, each person; $1.50 per day and up, one in a room. Room with bath, accommodating two persons, $4.

Also, rates may be obtained from the Hotel Grunewald, Cosmopolitan and Denechand, as follows:

Grunewald: Strictly European, in connection with which there are

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two restaurants—Single rooms, $1 per day for each person occupying same. Room with bath, $2.50 per day.

Cosmopolitan: European plan, $1.50 per day and up.

Denechand: American plan, $2 to $3 per day; European plan, from $1 to $1.50 per day.

More satisfactory arrangements can be obtained by securing quarters in advance of meeting.

The New St. Charles Hotel Manager announces that they will have ample accommodations, except possibly that single rooms may be limited; but their double rooms will be satisfactory, as they are large and well located.

Arrangements are being made with the various Passenger Associations' representatives to obtain reduced rates to New Orleans, which will include all the territory east of the Rocky Mountains.

Gas companies are solicited to send representatives to become members of the Association. The membership fee is $10, annual dues thereafter, $5. The Association publishes in bound volumes proceedings of its meetings. Copies when published are furnished free to members.

Queries for the Question Box, if mailed to the Secretary in advance of the meeting, will de assigned to members for answer.

Any information regarding the meeting will be gladly given by the undersigned. JAMES W. DUNBAR, Secretary.

[OFFICIAL NOTICE.]

Wrinkle Department, Western Gas Association.

WESTERN GAS ASSOCIATION,
OFFICE OF WRINKLE DEPARTMENT.
BELLEVILLE, ILLS., February 12th, 1902.

This department is now open and ready for contributions, which will be presented at the Twenty-fifth Annual Meeting to be held next May. The active co-operation of all members and friends is earnestly solicited. Please forward contributions to the Editor before April 15th.

W. E. STEINWEDELL, Editor.

BRIEFLY TOLD.

OBITUARY NOTE.—MR. HENRY G. BEATLEY.—We regret to be called upon to report the death of Mr. Henry G. Beatley, whose demise occurred at his home in Marquette, Mich., on the 10th inst. Deceased was born in Chelsea, Mass., July 20th, 1833, and his active business career was almost continuously concerned with the construction and operation of gas and water works' plants. His original prominent connection with these industries is traceable to his services on behalf of the proprietors of the Portland (Me.) Gas Light Company, and of the water supply system of the same city. On the completion of these plants he remained in the superintending direction thereof several years. He was also concerned in the construction of the gas and water supply systems of Ithaca, N.Y. Another important venture of his was the construction of the gas plant at Fort Worth, Tex., which he managed for quite a period. In 1891 he accepted the position of Superintendent to the Marquette (Mich.) Gas Light Company, and remained in its service until a few months ago. He was a prominent member of the Michigan Gas Association. He is survived by his wife, two daughters and two brothers. One of the latter (Mr. J. W. Beatley) was prominent in the gas business, from his superintendency of the Peoples Gas Company, of Brooklyn, N. Y., which corporation was subsequently joined with those in the merging that resulted in the formation of the Brooklyn Union Gas Company. For the main facts in this narration we are indebted to Mr. Henry W. Douglas, Secretary of the Michigan Gas Association.

AN INVITATION.—Mr. Robert Bruce Steward, Vice-President of the D. M. Steward Mfg. Co., of Chattanooga, Tenn., has extended the following invitation to the members of the Western Gas Association, who propose to attend the New Orleans meeting of that body—and there is no doubt that the Vice-President and his Company mean what is said: "Apropos to the Western Association meeting in New Orleans, I wish to call to your attention the excellent opportunity to stop over and see, in and around Chattanooga, one of the most beautiful and interesting sections of the country. The season will be most propitious, as the middle of May brings the full glory of the summer to us. The millions which the government has spent on the military parks and roads have transformed this vicinity during the past few years. In addition to the permanent attractions of weather, scenery and parks, there will be a regiment, at least, of United States Cavalry in camp of instruction at Chickamauga. From any point in the East and Middle West, Chattanooga is in almost direct line to New Orleans, and stop-over privileges can be had by asking for same, when the tickets are purchased, without any extra cost."

[CONTINUED FROM PAGE 536.]

PROCEEDINGS, EIGHTEENTH ANNUAL MEETING, OHIO GAS LIGHT ASSOCIATION.

HELD IN COLUMBUS, O., MARCH 19 AND 20, 1902.

FIRST DAY, MARCH 19, AFTERNOON SESSION.

General Discussion on the Subject of the Equity, Legality and Advisability of Charging Different Rates for Illuminating and Fuel Gas.[1]

The Vice-President—This very interesting and important subject is before you for oral discussion. I will ask Mr. Franklin to express his views thereon.

Mr. Franklin—I do not know that I can go into any detail in regard to differential rates. As far as Cincinnati is concerned we would rather have one price all round for gas.

Mr. C. S. Ritter—I might state it would not make any difference what we thought about it if the municipality, city council, or whatever division of the municipal government has charge of it, compel us to sell gas at the same rate. In Detroit they passed an ordinance putting the price at 70 cents flat and offered payment for bills at that rate. Of course, payment was refused and they were about to institute mandamus proceedings to compel us to accept that rate, but fortunately we enjoined them by getting out an injunction in the United States District Court, and that suit is now pending. Of course, we do not know what the outcome of it will be. The Supreme Court of the United States, however, very recently decided, in the case between the Detroit United Railway Company and the city, that a contract made with a municipality was valid and binding. That was a case where the city council passed an ordinance seeking to require the street railway company to carry passengers at 3 cents straight. The railway company refused to accept the franchise, claiming the right to operate cars under a previous contract, and the Supreme Court of the United States declared that as the railway had a contract with the city the city had to live up to it.

The Vice-President—That is very interesting, I am sure, of the statement of the case as it exists in Detroit. I have no doubt some other members here have had similar experiences which we would be glad to have them relate.

Mr. Marks—I presume a statement of the case in which a differential was carried too far might be of value to the members. The Fostoria (O.) Light Company employed me a year or so ago to ascertain, if possible, why they did not make any money. The old gas company was getting $1.75 per 1,000, and a promoter who bought up the natural gas mains proposed to combine the two and sell gas for fuel purposes at 50 cents and for illuminating purposes at $1. After running a year it discovered that instead of revenue accruing from the gas feature of the business it was necessary to constantly put in additional funds to keep it going. The fact of the matter is simply this—I think Mr. Doherty touched upon the feature in his written discussion—that discounts from any fixed price should be made in proportion to the amount of gas sold to the consumer, not for the purposes for which he uses it, whether it be for cooking, or asphyxiation or illuminating. If a man buys a very large amount of gas, it doesn't cost any more to take care of his meter than it does that of the man who buys a very small quantity of gas, and it does not cost any more in an office to send him a bill or to read the meter or to do clerical work, and the consequence is he really should have the gas at a less price. But, to come back to my "original mutton," I would say in deference to those owning the Fostoria Light Company, an organized effort was made to determine if such a thing were possible as to provide gas at 50 cents and simply get out even on it. After 12 months of persistent labor it was found to be absolutely impossible, no matter how large a quantity of gas you might sell, to ever sell it at 50 cents. The total output, if taken by one concern, could have been sold at cost at about 65 cents, and no profit in it at all. That was the extreme limit of price for the very largest output that anybody could possibly take.

A Member—What is the price of coal there?

Mr. Marks—Run-of-mine, $2, delivered on siding in yard. Slack, which we worked in at times, was sold to us as West Virginia coal, very rich in gas, at $1.50 on siding.

Mr. Littlehales—I would like to ask Mr. Marks what was the output per annum and the capital per 1,000.

Mr. Marks—Gentlemen, you will excuse me for being a little prolix. The promoter assumed that if he sold artificial gas at 50 cents per 1,000, the artificial gas would instantly take the place of natural gas, which

1. For the written opinions on this topic, see JOURNAL, April 14, pp. 534-5-6

had been sold at 25 and 30 cents per 1,000, and that everybody would use the artificial gas as they did the natural gas, so he proceeded to put in works calculated to deliver the greater portion of 180,000,000 cubic feet per year in a town of 7,800 inhabitants. When I stopped the work he then had a daily capacity of 350,000 cubic feet, and the work was stopped by my orders. He was then able to turn out 350,000 cubic feet of gas per day. It was the wildest thing I ever heard of.

A Member—Was he turning it out into the atmosphere?

Mr. Marks—No; the salable output for 1 year was about 18,000,000.

Mr. Littlehales—What was the capital in proportion to the gas made? That is what I want to get at because it fixes the price at which gas can be sold more materially than any other one question.

Mr. Marks—If you are putting in a gas works property, I should fancy that annually 1,000 feet would mean about $2.50.

Mr. Littlehales—I agree with you thoroughly.

Mr. Marks—But, without revealing the secrets of my clients, I would say that much more than $2.50 was put in.

Mr. Littlehales—Gentlemen, therein lies the milk of the cocoanut.

Mr. McIlhenny—In reference to the discussion on this subject it might be of interest to mention the fact, which was referred to, I think, a couple of years ago, of a somewhat similar case that was carried to court in the State of Pennsylvania. The final decision thereon was that gas could be sold by an artificial gas company for certain purposes at a lower price than it could be sold for other purposes. That is, it could be sold for fuel purposes at a less price than it could be sold for illuminating purposes, but that natural gas could not be sold at a greater price for illuminating purposes than for fuel purposes. The case was carried from the lower courts to the Superior Court of the State, because the natural gas company, which acquired control of the illuminating gas company in the town, wished to compel consumers to only use the natural gas for fuel purposes. So that it increased the price of natural gas to the illuminating price when used for the purposes of illumination, retaining the old price for fuel gas. The citizens resisted that effort on the part of the gas company, carried it to court and won, and in his decision the Judge stated that natural gas comes out of the ground without any volition on our part, and as freely one part of the day as another; consequently the particular use to which it might be applied could have no bearing upon its source or its cost. Whereas, in the case of artificial gas, as it can only be used at a certain time of day or night, and its use would, therefore, be hampered and limited, the plant could not be run continuously, and during the day, when there was the least demand for gas, the company could certainly sell it at a lower price, and that it would be equitable for the company to do so. That case was decided about three years ago. My own judgment would be that it is often very largely a question of local expediency whether a differential price should be charged. But, as far as I can see, the company would be warranted, if the expediency demanded it, to charge differential rates, and largely for the reason which the court gave in the case just cited. I believe if it were ever carried up into the highest courts the latter would uphold the right to do it. The railroads have gone through a vast amount of litigation in this country on that very subject, and they have differential rates. The man who buys a 1000-mile ticket can travel cheaper than the poor man who cannot buy it. Like practice applies to certain classes of freight, which you might say are equally perishable, so that that feature does not enter into it at all. That practice on the part of the railroad companies has been upheld so far. Therefore, by analogy, I should say that gas companies certainly can do the same thing.

The Vice-President—I would like to ask how far that case was carried up in Pennsylvania, Mr McIlhenny?

Mr. McIlhenny—My recollection is, that it was carried to the Superior Court. They now have a Supreme Court. It was not carried further than the Superior Court, which has jurisdiction over a certain class of cases

The Vice-President—The point brought out by Mr. McIlhenny is a very interesting one, as it shows the trend of decisions so far as the legal features of the question are concerned in other States, and, of course, it would have a bearing in this State also, as a precedent. We would like to hear further from members who have anything to say on this subject.

Mr. Eyesenbach—Mr. Doherty says the ideal towards which we should work is a uniform load throughout the 24 hours. I would like to ask him, if the day load became larger than the night load, would he be in favor of charging less for gas used for light than he would for fuel, in order to bring about that uniform load?

Mr. Doherty—I am going to request the privilege of closing this discussion, and I will answer all of these questions at that time, with the permission of the members.

The Vice-President—Mr. Perkins, may we hear from you on this subject?

Mr. Perkins—I do not feel competent to discuss it. It is a question that has never come up in our place at all.

Mr. J D. Shattuck, being called on by the Vice-President, said—The point occurs to me that we cannot fairly discriminate in suburban districts. For instance, we are located in a large city where the rate is $1, but in another territory we are supplying at the rate of $1.25. We are going to try to maintain the $1.25 rate, based on the greater cost of distribution. I do not know exactly where we will land on that point.

Mr. Perkins—We have a similar condition of affairs to that noted by Mr. Shattuck. We have an outlying district and are allowed to charge a higher rate therein by franchise.

Mr. A. P. Lathrop, being called upon by the Chair said—I do not see how anybody is injured, as Mr. McMillin suggests in his letter, by a different rate being given for special purposes. I do not think it is fair to discriminate by charging one man $1 for illuminating gas and another man 80 cents, but if they all pay the same price for lighting, and others get a special rate for a special purpose, and all of them have that privilege, I don't see how anybody is going to be harmed at all.

Mr. Littlehales—The greatest and most marked instance of discrimination is in the fact that railroads carry dead freight on freight trains for about one-tenth of the rate that they charge for live freight. Isn't that a discrimination? If discriminations are to be abolished, then I presume that human beings should be carried for the same rate as dead freight so much per ton. (Laughter.) That is a case of a very marked discrimination, to my notion.

The Vice-President—Before turning the matter over to Mr. Doherty for final answer, I would like to ask Mr. Franklin how the difference in rates has worked out in Cincinnati, as a general proposition? I understand that they had quite an amount of business at the 75 cent rate, where they now have a rate of 50 cents.

Mr. Franklin—We charge 75 cents for illuminating and 50 cents for fuel, and I may say we are only sorry that we can't get 75 cents all around.

The Vice-President—Possibly you did not catch the point of my inquiry. I understood that there was quite an amount of business at the 75 cent rate before the change in rates, and what I intended to inquire was whether those receiving gas at that rate before have now changed over to the 50 cent rate, or still continue at the 75 cent rate, requiring two services.

Mr. Franklin—By reason of the expense which would have to be incurred in making changes, a great many are still continuing at the illuminating price, and we fully sanction their idea of economy. (Laughter.)

Mr. Perry—Regarding the comparison between railroad rates and gas rates, would it not be fair to take into consideration a plan adopted in railroad rates—that is, the theory of fixing a rate which the traffic will bear. Compare the rate with what the traffic will bear in gas consumption. I would like to inquire whether or not the two things could not be compared in the same way.

The Vice President—If there are no further remarks, I will ask Mr. Doherty to answer a few of the questions that have been put to him.

Mr. Doherty—The first question I want to answer is the one put by Mr. Eysenbach. He asks if I would charge more for the daylight lighting than night lighting. I make no distinction with reference to the time the gas is used. I hold that that consumer should have the lowest rate which occasions the least demand and uses the most gas. That is, if he demands 100 cubic feet per hour, if that is his maximum rate of demand, and he uses it for 10 hours per day, he should have a lower rate than the man who demands 100 cubic feet per hour, or at that rate as a maximum, and only uses it for 2 hours per day. Now, so far as daylight and night consumption is concerned, I do not see why you should divide between 6 o'clock into 6 o'clock, as the thing you must provide for is your instantaneous demand and no matter where it occurs; if you have 5 minutes of the day when you must send out gas at an excessive rate, then that is what you have to provide for. Another speaker asked why it should not be charged at what the traffic will bear. That was the point I was trying to bring out by showing that gas for illuminating purposes is already down to where it will compete with all forms of illumination, except natural gas and daylight. We are already furnishing it so cheap that we can command commercial lighting in competition with every other form of illumination, except natural gas and daylight and arc lights where they are sold very cheap. On the other hand, selling gas for fuel purposes at $1 per 1,000 is equivalent to selling coal at $5 per ton. So we cannot hope to compete with coal to the same extent we could compete with electric cur-

rent, or kerosene, or other illuminating agents. We cannot hope to compete with fuel agents to the extent that we can with illuminating agents. I do not hold that differential rates are equitable, but I do hold that they are more equitable than a uniform rate. A uniform rate is absolutely inequitable. Assume that I have a consumer who uses absolutely no gas at all. I have to read his meter. I have to provide him with a meter, make out his bill, keep track of his account, stand the depreciation and repairs on the meter, as there are depreciations and repairs, even though the meter is not used. The cost for supplying that man with gas will be infinitely great. If he uses 1,000 cubic feet of gas per year, and it costs me $6 per year to take care of his account and maintain his meter, that gas has cost me $6, plus the cost of manufacture, and I have only $1 to show for it. As far as giving discounts on the basis of the quantity of consumption is concerned, I see no way of doing that without making an arbitrary dividing line, and it all means that one consumer can pay more for a less amount of gas than another consumer for a greater amount of gas. That is surely inequitable. Say we charge $12 per year for "Readiness to Serve," and he uses 1,000 feet of gas per year, selling gas at a uniform rate of 50 cents then he would pay $12.50 per 1,000 cubic feet, and if he used 2,000 cubic feet, he would pay $12 per 1,000. Then he would get a constantly descending rate, while by a discount on the quantity of consumption you would not have a gradual descending rate, but a rate descending by steps, and it means that if your dividing line is 50,000 cubic feet, the man who uses 49,500 cubic feet will have to pay more than the man who uses 51,000 cubic feet. The main point in this discussion is to justify this differential, and on the ground that the fuel business, or traffic, as one speaker has referred to it, will not stand a high rate, and if you get any price above your operating cost, your fixed charges, which are occasioned by that class of business, and that class of business alone, anything above that you can apply to all of your business, and in that way you can sell your illuminating gas for less. I am confident as you reduce the price of fuel gas you open up enormous fields of application. As you reduce the price of illuminating gas you do not. You open up a very limited field of consumption. You open up a field of carelessness in the one case, and in the other case you open up a field of real possibilities. If you are selling a man gas at $2 per 1,000, he will be very careful how he uses it, but if you sell him gas at $1.50 he is less careful, and at $1 he is still more careless. However, when you commence to reduce the price of fuel gas from $2 per 1,000, you are constantly going to that point where a higher efficiency of gas fuel appliances will make it possible to use it instead of coal, although on the basis of heat energy you are selling gas at about 12 or 13 times as much. I think the company is benefited and I think the consumer is benefited by marked differential between the price of illuminating and fuel gas. Some lighting business may be just as desirable as fuel business. Take it at a 24-hour consumption, the lighting business would be very desirable. On the other hand, I can conceive of a fuel gas consumption, instead of occurring 3 times a day, as cooking gas is apt to occur, that might occur once a year in most enormous quantities, but we cannot make fine-haired distinctions in this matter. As a rule, fuel gas does not produce the same maximum demand as lighting gas does for the same quantity of consumption. Practically all your lighting gas is sold in the early evening, while fuel gas starts in at 6 o'clock in the morning, and it really never stops through the 24 hours, and with a great many consumers it never stops from 6 o'clock in the morning until 11 or 12 o'clock at night, while with lighting gas as a rule the users turn it out by 9 or 10 o'clock in the evening, except one jet just allowed to run in the bathroom or the hall, or something of that sort.

The Vice-President—Gentlemen, you have heard some very interesting written and oral discussions and I know that we are all indebted to Mr. Doherty for bringing this matter before us in the shape that he has. (Applause.)

President Doherty, resuming the Chair said—We intended to cover to-day the commercial portion of this programme. When we finish that, perhaps we had better take up some engineering subjects, because otherwise we will have more than we can do to-morrow. I now suggest that we take up such queries in the question box as relate to the commercial branch of the gas industry. One of these is:

> Question No. 4.—"In a plant carbonizing 5,000 tons of coal per annum, which is more profitable, the concentrated or sulphate of ammonia plant?"

Mr. Andrews—We are running quite a large plant at Hamilton and making concentrated liquor entirely. Before going into it we of course investigated the matter as thoroughly as we could, and found that the opinion of most people was that the wear-and-tear or depreciation of a sulphate ammonia plant was so great that it more than off-set any possible advantages which might be obtained form concentrating the liquor. For that reason we did not adopt it.

The President—Any further comments on that question?

Mr. Cline—Mr. Light operates a sulphate plant.

Mr. Light—We have been operating a sulphate plant about 15 or 18 years, and of late have not had much trouble with it. Some years we had an advantage over the concentrated and then again they would get a better price than we. We still consider it satisfactory, and in fact we are going to enlarge this year.

Mr. Littlehales—That question seems more largely one of where and for what purpose you sell your product. Of course, if your product is going to be used for the manufacture of fertilizers it would be almost necessary to have it in the form of a sulphate. If you are going to use it, for example, for soda ash manufacture or anything of that sort it would be very much cheaper to concentrate it into liquor. So I think it depends largely upon what the product is to be used for.

Mr. Cline—I should think it would depend upon the market price of the two products.

Mr. Littlehales—If it was for fertilizer purposes they would have to have it in the form of sulphate almost of necessity, otherwise there would be such a loss of ammonia. On the other hand, if for the purpose of soda ash manufacture they would have to have it in a liquid.

The President—Here is a query that is purely commercial and not engineering.

> Question No. 6.—"Can you legally shut a consumer's gas off for non-payment of a disputed bill?"

If that word "legally" were not there it could be answered much easier.

Mr. Lloyd—I think it was settled, in a case recently tried in Montreal, and decided by the highest court of Canada, that one cannot shut off a consumer for non-payment of a bill.

The President—That seems to be off the line of the question, which is, "Can you legally shut a consumer's gas off for non-payment of a disputed bill?" or, in other words, where the accuracy of the bill is in dispute.

Mr. Lloyd—They would have to prove that the gas was consumed, of course.

A Member—It has just been decided in New York that one cannot shut a person's gas off for a preceding bill in the same house; as, for instance, a new tenant moving into the house. A case was recently decided in New York where large damages were collected.

The President—I should say not.

Mr. Ritter—I was about to suggest that the consumer's recourse is to pay the bill under protest. Then, if it is decided in his favor, he has opportunity to recover.

Mr. Stone—This question came before us a while back, and we referred it to our attorney to ascertain how we would stand in the matter legally. He informed us that in case of a disputed bill we cannot shut the man off, if he is willling to guarantee his future bills. As long as he is willing to pay future bills you cannot shut him off, so our only recourse is to sue him for the amount of the disputed bill, if he wants to hold out, and you have no right to shut him off. If you shut him off on a disputed bill he could bring an action in damages against you.

The President—The next question is more largely of a commercial nature than anything else:

> Question No. 8.—"What is the most satisfactory meter (other than the proportional) having a capacity of 2,000 to 6,000 feet per hour, for measuring gas supplied to gas engines?"

I will call on Mr. McIlhenny.

Mr. McIlhenny—I should think, Mr. Chairman, if it was in a location or point where they would have no use for a station meter, that the most satisfactory solution of the problem would be the use of a battery of large, dry meters, which meters then could be used for other purposes, and it would also be of less trouble to the consumer as well as the company if at a distance from the gas works.

Mr. Whysall—I would like to ask Mr. McIlhenny what he means by the statement that the meters could be used for other purposes.

Mr. McIlhenny—That they could be used for other consumers. It necessarily involves an investment. I have known of a similar case where a company did not want to install a station meter for a large consumer because the business was not of the character that they thought it could be afforded, and they also would not want to put in a very large dry meter even where the case was not so extreme as this, and my suggestion was that if they put in two or three smaller meters they would

then have a meter which they could use at other points, or for other consumers if they should lose that one.

Mr. Whysall—Then you are assuming that the equipment is temporary?

Mr. Ilhenny—No; not necessarily, I am assuming, as has often been found to be the case from experience, that with the changes being brought about the tendency is for every large consumer to supply his own lights or his own fuel, whichever it may be. Very frequently large meters have been displaced and the company would have no use for them, but if they should put in a sufficient number of moderate sized meters—for instance, if instead of one 300-light they put in two 150-light meters, they would have a commercial article which they could use some other place and supply gas to this large consumer through two moderately sized meters instead of one large one. I would recommend in this case the use of a sufficient number of meters of about 200-light capacity, to give the required amount of gas, of the ordinary dry type.

Mr. Littlehales—Has any member ever had any such experience with the proportional meter working under low pressures? I have had some little experience with it and it has been most unsatisfactory. One can understand that a proportional meter will work satisfactorily under a high pressure. For example, take natural gas at a pressure of 100 pounds. Suppose it takes 1 pound to drive that meter. It is hardly noticed, whereas when you come down to low pressures the friction on the proportional meter with the low pressure is so much in proportion to the pressure that it does not register accurately. In two or three instances I could not do anything whatever with the proportional meter on that account.

Mr. Whysall—I think Mr. Neeley could give us some information along that line.

Mr. J. D. S. Neeley—I probably could not answer the question as to very low pressure—that is, on what would probably be an artificial pressure; but we use a great many of them on natural gas and find them eminently satisfactory. We believe they measure accurately and give as good satisfaction as any meter could possibly give. And they even do so when we are down to a one-half ounce pressure. I have never tried one on artificial gas, but I think they are very good meters, and I believe would measure accurately on both pressures.

The President—Mr. Malone, did you ask this Question No. 8?

Mr. Malone—Yes, sir. Having occasion to install a gas engine of 200-horse power, we did not know what style of meter to adopt. We had intended to adopt the proportional. I wrote to several and found that the experience of some who had used them had not been eminently satisfactory, and I concluded to ask the question for that reason. I put the same question before the Wisconsin Gas Association, which was organized recently, and as nobody there seemed to be able to answer the question I concluded to send it in here. Since then we had occasion to connect up in multiple 5 Equitable meters, made by the same parties who make the proportional, I believe, and found that under a half load they gave very good results. They were connected up on the plan that Mr. McIlhenny spoke of. Their cost was much less than that of the ordinary dry meter, but they pass the gas very freely and register closely. They had a capacity of 1,200 feet each, which would be 6,000, and the maximum demand on the engine would be 5,600, so that we had 400 for a margin to work on.

The President—I think I remember passing on that purchase, and the things which influenced us were mainly, as I remember it, space and cost.

Mr. Malone—Yes; the space is very much less—probably 50 per cent. less than the smallest proportional meter, as I remember it.

The President—Now, here is a query that should interest us all:

> Question No. 12.—"What method should be employed in comparing station meter with consumers' meters to obtain the nearest correct loss of leakage and condensation?"

Can anybody give us any advice on that point? Mr. Lathrop, I thought you had a scheme up your sleeve for getting more accurate results.

Mr. Lathrop—We are trying to ascertain how to test a station meter with any degree of accuracy.

The President—If that question is not answered now I will bring it up to-morrow. I guess we better give you time to think about it.

Mr. Lloyd—We do not cut off our consumers' quantities and the station meter on the 1st of the month, but we have what we call a mid-date for the meter reading, which mid-date is determined as closely as possible with reference to the middle line of output for the time in which the meters are read. For instance, it will take us a portion of 2 or 3 days to read all the consumers' meters. And we strike a point, as nearly as we can estimate it, which is the middle of those 3 days, and the station meter is read at the same time and comparisons are made between those mid-dates.

Mr. Mulholland—Would not the business district of the town enter very considerably into that, as to which date he happened to read that on. I would like to inquire whether you divide your business district equally during that specified time, or do you take that in during the first half or second half?

Mr. Lloyd—We do not take the mid-date necessarily on the middle line between the beginning of the reading and the ending of the reading. We use our best judgment, which is as near as we know how to estimate it, as to the consumption which would occur in that half or the other in that middle line. Suppose for instance we take 3 days as the time within which the meters will be read. We may not take 1½ days from the beginning or the end as the mid-date. It may be 2 days off or 1 day off, according to the districts we are reading. It is purely a question of judgment.

The President—I think that is probably the best answer we can get to the question. It is the way I have often thought of treating it, and then keeping a gas stock account to compensate for all differences between the amount used, or the monthly report of gas manufactured and the real amount manufactured during the month.

> Question No. 13.—"What success are gas companies having with the gas arc lamps; and how is the best way to introduce them?"

Mr. Andrews, they tell me you have recently put in 200 of them.

Mr. Andrews—I believe most thoroughly in the adoption of gas arc lamps, as being the best way in which we can get back the lighting business which has been taken from us in past years by electricity. After the first cost of gas for lighting is reduced so much per unit, as shown by Mr. Doherty's figures, people can afford to have a great deal more illumination than they ever had before. This also increases your consumption very largely in a very short time after the lamps are introduced. The way it appeals to me is that we can afford to put these lamps in at a very small rental—in fact, simply maintenance charge you might say, as the increase in business is sufficient to justify it. In our case we put in something like 200 since the first of the year, and find the average consumption is about 2,000 feet per month per lamp. This is a larger average than other classes of consumers that we go after—for instance, stoves—and the amount paid out for the services and the meters and everything of that kind will greatly exceed the cost of the gas arc lamp. So I look upon it as a very good investment, even if you do not get anything more than the actual maintenance charges on the lamp.

Mr. Franklin—Regarding gas arcs, in 1899 we started out to supply them in competition with electric. The first year we put out 1,600 of them on a twelve months' trial. Last year we started out to collect the bills for them and took down probably 55 or 60 out of the entire output. This year we are putting them out at $1 per month, payable in one year, or $12 a lamp.

The President—You are selling, not renting them?

Mr. Franklin—Selling them outright.

Mr. Lathrop, being called on by the Chair, said—Mr. President, I think the advertisement shown on the wall of this room proves what can be done with the gas arc lamp. [The advertisement referred to was as follows: "The Humphrey gas arc. The only gas arc used by the People's Gas Light and Coke Company of Chicago: 10,000 placed in Chicago since October 1st, 1901."] I must say, in going through Chicago last evening, I was surprised to notice the extent of the use of this gas arc lamp. All classes of business seem to be using it, and it must certainly be making great inroads in other forms of lighting. In Minneapolis (Minn.) the Gas Company has I think put in about 1,200 of them, which shows how successful they are at that point.

Mr. Neeley - I think the gas arc lamp is the salvation of the gas company. I believe in localities where they do not have municipal ownership of an electric light plant that the gas company by the use of the arc lamp can put the light plant out of business, if they push it right. I think a great mistake a gas company makes is that it will buy an arc lamp for $8 and then try to get the consumer to pay $12 for it. Now, that is a poor way of competing with the electric light company. The electric light people buy the lamp, put it up and maintain it. Of course, they get a little more money, but it costs them more to get their current and maintain it, I believe if the gas companies would adopt some plan to put out arc lamps and maintain them that they would increase the sale of gas enough to more than recompense them. We have been experimenting a little with it in our town and find it builds up trade. They will use more gas and we are getting more money out of it. I believe the time is not far off when we will not only be giving arc lamps to the consumer, but will be furnishing mantles free, and will be

doing the business of all the towns, if it is properly pushed. There is no question that gas light is *the light* and that it can made the light in every town, and especially in the smaller sized towns of the country. Of course, it takes some energy and some hustle. We will have to have a little scrap once in a while with the municipal council, but that kind of exercise merely broadens you, you know. I have in mind one town in particular which, from the lighting standpoint, is an ideal town. That is the little town of Sidney, O. We control the natural and the artificial gas supply, and the electric light too, so that we do not have much trouble there.

The President—The next query is:

Question No. 14.—"What value should we place on our retort carbon?"

The fellow who asked that was optimistic.

A Member—I think the other fellow fixes that value.

Mr. Lathrop—I do not see that it makes much difference what value we place upon it. The important question is what can we get for it?

Mr. Schwarm—I asked that question because, having quite a little stock of carbon at Lorain, I took the matter up with several carbon manufacturers and had various offers. One of them offered me $11.50 a ton, another $13 and yet another $15. Of course, I took the last named offer. Two or 3 days afterwards I was talking with one of the engineers of the United Gas Improvement Company and the conversation drifted onto carbons. He asked me what we were getting for carbon, and I said about $15 a ton. He said: "You are selling too cheap; we are going to hold our carbon until we get about $25 per ton. Our Company figures it is worth about that much to the carbon manufacturers." What I wanted to bring out was that if we could get $15 or $25 a ton everybody should be made cognizant of the fact.

The President—The next query is:

Question No. 15.—"Why not suggest to the publishers of our standard gas papers to reduce the size of same to more nearly conform to the size of the standard magazines of the day; the advantages in favor of the smaller publications being apparent to all?"

Mr. Schwarm—I also asked that question. I cannot see why we could not have our gas journals cut down into smaller volumes that are handy to put on our desks or to bind in good shape for the library. The tendency all along the line to-day seems to be towards decreasing the size of all the trade or technical journals, and I should think if the Associations would suggest that to our publishers there would be no reason why we could not have the advantage of a book smaller in size and better adapted for reading purposes.

Mr. Littlehales—The last speaker is not like some of us who have to carry glasses on our noses. It often happens that the reproduction of plans, or of the apparatus illustrated in these technical papers, will occupy a full page, even as large as the latter now are, and then the figures are small enough, so I think it would be utterly impracticable to get the full advantage of some of the plans that we want to see reproduced, if the technical journals should reduce the size of their pages to the ordinary magazine size.

Mr. Perry—Responding to what the last speaker said, it might be suggested, in a case of reproduction of cuts, they might be bound on one side and folded in, thus permittlng the cuts to be of any size desired.

The President—I do not believe there would be much chance, gentlemen, of getting the publishers of these journals to seriously consider any change, unless they knew what percentage of the gas fraternity wished such a change to be made. If you are interested enough in it, I suggest that all who favor reducing to that of the ordinary magazine size signify the same by holding up their hands.

Mr. Cline—Before the question is put to the house I would like to inquire if a decrease in the size of the paper will bring about a corresponding decrease in its price? (Laughter.)

The vote on the question was then taken, and stood 31 to 3, about 40 or 50 members not voting.

The President—That will reach the publishers of the journals without further comment. We have covered nearly all of the work planned for to-day, but to-morrow we will have to do some very hard work in order to get through with the programme. It is up to the members whether they prefer to continue this session longer or to adjourn now and work all the harder to-morrow. You can look over the programme and see what remains to be done. We have the reports of five committees and six discussions, the Wrinkle Department, election of officers and general or unfinished business.

On motion of Mr. Stone it was agreed to go on with the programme.

The Secretary—The Association having "turned down" the very kind invitation of the Columbus Gas Companies to take a trip as their guests to Sugar Grove on Friday morning, the Companies are anxious to do something for us while in the city, so they have supplied us with theater tickets for this evening. The theater is in this building and I simply desire to announce that any members desiring to form a part of the theater party of the Ohio Gas Light Association to-night, as guests of the Columbus Gas Companies, may receive tickets by applying at the Secretary's desk. I may also say that Mr. Field, the local manager of the Welsbach Company, who very kindly presented the flowers upon the President's table, invites the membership of this Association to his store to see his display of Welsbach wares at No. 44 North High street.

The President then called upon Mr. E. E. Eysenbach, Editor of the

WRINKLE DEPARTMENT,

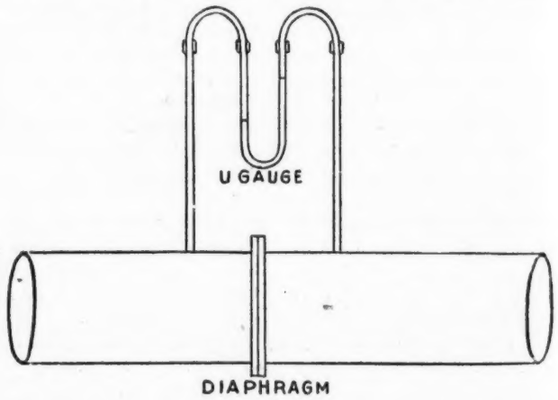
who read the following budget:

Wrinkle No. 1. Method of Taking Scale out of Gas Engine Cylinders.—Mr. C. W. Andrews gives a description of the following method for taking scale out of gas engine cylinders where hard water is used: "In our Westinghouse engine, on which we use this device, there are several plugs on top of the jacket and also a petcock for draining at the bottom. After removing the top plugs we drain off the water from the jacket, and after closing the lower petcock fill the jacket with commercial muriatic acid. This is allowed to stand in the jacket until the decomposition of the scale, with the attendant evolution of carbonic acid gas, is completed, as far as that amount of acid is concerned. It is then drawn off through the lower petcock, and the jacket thoroughly washed. If the scale is light one application is generally sufficient. If not sufficiently removed, the process is repeated until fresh acid does not cause any further evolution of gas. In this way the necessity of taking the jacket apart is usually avoided."

Discussion.

The President—As no one seems to desire to make any comments we will take up—

Wrinkle No. 2. A Resistance Meter.—Mr. Donald McDonald gives a description of a device for measuring the amount of gas, air or steam passing through a pipe without a meter. This device is called a resistance meter, and is constructed as follows: "The pipe is parted at any convenient point, and a sheet iron diaphragm inserted, the diaphragm containing one or more holes of known size. The size of these holes must be governed by the amount of resistance which can be produced in the pipe without inconvenience. The pipe is then tapped before and after the diaphragm which causes the resistance, and ¼-inch pipes are then led to any convenient point for taking observations, when the two pipes are joined by rubber tubes to the two ends of a U-gauge filled with



Wrinkle No. 2.

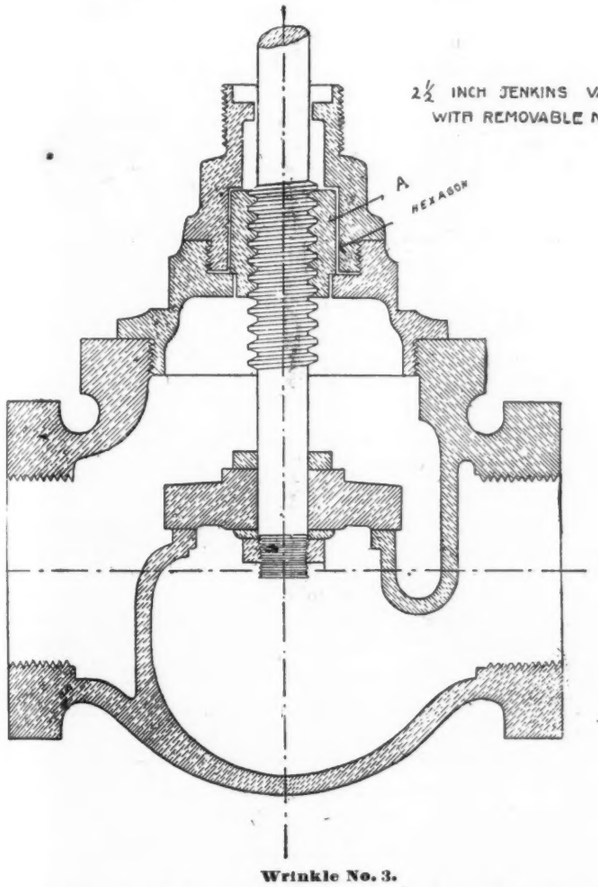
water. The reading of the U-gauge will always show the amount of resistance which the diaphragm causes to the flow of gas through the pipe. By taking and recording frequent observations of this resistance, the daily delivery can be ascertained very closely, while for the purpose of ascertaining instantly just how much gas or air is actually flowing through, the device is a better one than any other form of meter. We have used a device of this sort for the last 10 years, and have always found it exceedingly convenient and accurate. For the information of anyone intending to construct such a gauge, I will say that a sheet iron diaphragm with a circular hole 3½ inches in diameter passing 300 feet per minute of carburetted water gas will cause a resistance of 2 inches of water. If the resistance is multiplied by 4, the delivery will be doubled. With this for a basis, a meter can be constructed to meet any

conditions of delivery desired, and resistances which can be tolerated that are likely to arise, and a table can be made up by means of which the resistance in inches and tenths can be read into cubic feet delivered per minute."

Discussion.

The President—That is based upon the law that the flow of gas through an orifice is as the square root of the pressure.

Wrinkle No. 3. A Bonnet for a 2½-Inch Jenkins Bros. Valve, to be Used on the Reverse Steam Valves of Generators.—Mr. W. C. Morris gives the following: "These valves are operated so frequently that the ordinary bonnets wear out in a very short time, and need to be replaced at considerable expense and labor. The bonnet which is shown on the

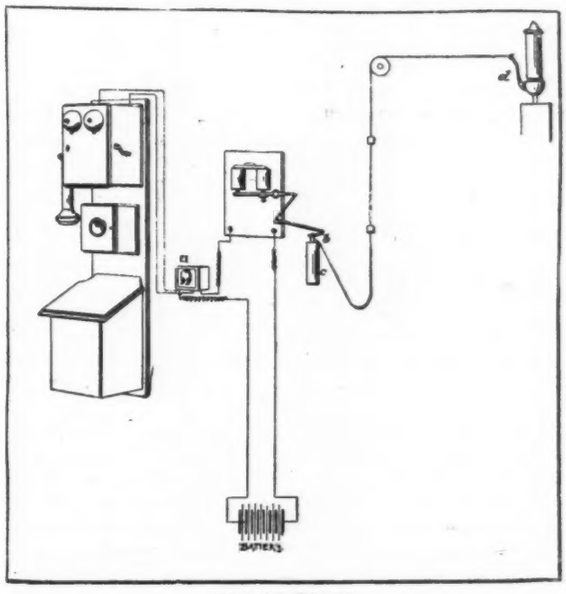


Wrinkle No. 3.

sketch is made all of cast iron, with the exception of the stuffing-box nut, which is not shown. The hexagon nut *A* is replaced as it becomes necessary by wear, as well as the stem, but the expense of replacing this nut is very much less, amounting to about 8 cents or 9 cents per change, as against about $1.50 for a complete bonnet."

Wrinkle No. 4. A Coke Screen.—Mr. Ernest F. Lloyd gives the following description of a coke screen: "It is now in use at a number of works, and has been successfully employed at the works of the Adrian (Mich.) Gas Company. It consists of an elevated runway up which the coke as taken from the retort house is wheeled. At the top it is dumped over the side of inclined screens made of common ¾-inch gas pipe, the ends flattened out and nailed to ordinary timber supports, being set on an angle of 45°. The coke is dumped on the upper end of this screen, which is about 7 feet long on the slant, and in running down that distance practically all of the coke which will pass between the pipe bars does so and falls to the bottom. An extension of the same idea can readily be had by another screen set below the first one and at an angle of 45° to it, and, being composed of about ½-inch pipe set closer together, will separate the coke breeze from the crushed coke. At Adrian these screens are mounted upon a tram, which runs on a truck, the end of the elevated runway being extended on the level, so that by moving along the screen it can be made to discharge into different bins, and thereby serve a considerable sized coke shed."

Wrinkle No. 5. A Telephone Connected with Steam Whistle.—Mr. L. W. Wells gives the following: "Usually at a gas works, especially in or near the retort house, there is much noise, and a call from the ordinary telephone bell cannot be heard at times by the workmen. In consequence much time is lost at the uptown office in communicating with the works. The device illustrated in the drawing in connection with the telephone is the result of an effort to shorten the time in getting some one to the telephone. When a call is made from the central station, the



Wrinkle No. 5.

drop *A* falls, releasing the trip on which the weight is hung at *B*, causing the weight *C* to fall, which opens the valve at *D*, thus blowing the steam whistle until the telephone is answered; at the same time the device is readjusted, ready for the next call by the party answering. No battery power whatever is used, only when the drop *A* is down."

Wrinkle No. 6. A Cement for Pipe Joints.—Mr. George Light sends the following description of a cement used at his works: "Take ordinary pine tar and mix it with dry oxide of iron. This putty will make as good a joint on a faced or rough flange joint as red lead putty, at one-tenth the cost. It will not harden as soon as red lead, but is very adhesive under pressure."

Wrinkle No. 7. A Coke Wagon.—Mr. John D. McIlhenny sends the following description of a coke wagon: "At a plant in a city whose population is 12,000 the hot coke is conveyed from the retort house to the coke shed, some distance away. The wagon used for this purpose has been in use for about 18 years, and is in splendid condition to-day. The wagon, instead of being made of sheet iron, is made up of flat iron strips, something on a basket idea. The strips are about 1 inch by 1¼ inch, being riveted together where crossing, the openings being 1 inch square. The axles and wheels have been renewed several times, but the identical body is in use to day as made, certainly 18 years ago. The same idea might be applied to coke wagons and coke barrows, and possibly in a less expensive way than the bar construction, by using a perforated sheet iron of a greater thickness than the ordinary sheet iron now used."

Discussion.

The President—Any comments on that wrinkle?

Mr. McIlhenny—There is a misprint. The strips, instead of being 1 inch by 1¼ inch, are ¼ inch by 1¼ inch. It would be rather a heavy bar according to the printed description.

The President—I was thinking that quarter inch bars would make a very heavy wagon.

Mr. McIlhenny—It wasn't unduly heavy.

The President—How do you explain its long life?

Mr. McIlhenny—By the fact that it could not hold any water after the coke was dumped, and it could not be heated so highly by having a current of air through and around the bars.

The President—Would that not create combustion?

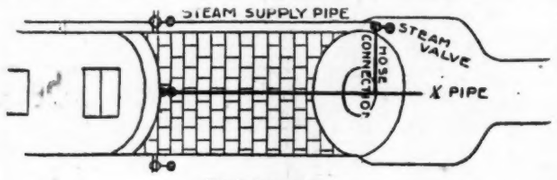
Mr. McIlhenny—It would make the coke a trifle hotter, but the air would keep it cool, on the same principle that bars in a furnace are kept cool by the water underneath. The main thing of interest to me was in the fact that the wagon was in use about 18 years, and was never re-

placed once. The only way I can account for it is through this open work construction.

Mr. Dunbar—I want to ask, in the idea suggested by you that the openings would cause increased combustion, whether the loss in weight of coke would not far outweigh the advantages to be derived from such a wagon?

Mr. McIlhenny—I did not go into an analysis of it at all, but I think the difference in the combustion of coke would not be material, as it is quenched in such a short time that it would not be appreciable.

Wrinkle No. 8. *Cleaning Superheater.*—Mr. D. S. Milne gives the following suggestion for cleaning superheater before starting machine in the morning: "A ½-inch pipe, with flexible steam hose connection, is passed down between the brick in the superheater and the steam allowed to escape in passage. The operator passes this pipe many times



Wrinkle No. 8.

into the superheater each morning, cleaning same thoroughly. The use of this device adds materially to the good work of the machine and life of superheater. Four 1-inch steam connections made just above the arch used for blowing dirt out of superheater can be used any time between runs."

Discussion.

The President—What do you think of that idea, Mr. Shattuck?

Mr. Shattuck—I do not quite understand where the pipe is applied.

The President—Do you understand it, Mr. Eysenbach?

Mr. Eysenbach—I think he lowers the pipe down in the brickwork.

Mr. Shattuck—And the flexible hose does not come in contact with the brickwork?

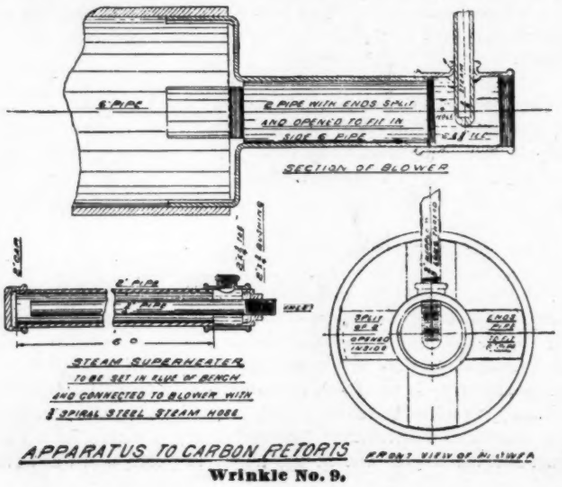
Mr. Eysenbach—No; he has a long ½-inch iron pipe to let down into the brickwork, and that is one in which connections are to be used at any time.

Mr. Shattuck—I think considerable dirt would be blown out of the machine that way.

The President—I don't see how he can get around his checkerwork to amount to anything.

Mr. Shattuck—If his checkerwork runs back and forth, I don't see how he can get down to it.

Wrinkle No. 9. *Apparatus for Decarbonizing Retorts.*—Mr. John M. Robb gives the following method of decarbonizing retorts: "Material required is a piece of old 6-in. wrought iron pipe about 9 or 10 ft. long; a piece of 2-in. pipe, 12 in. long, one end threaded and the other end split and opened out into four prongs, which will fit tightly into the 6-in. pipe; one 2-in. by ⅝-in. tee; one ⅝-in. nipple, with one end closed over, a ¼-in. hole drilled in side near closed end, and nipple threaded long so it can be screwed into tee to bring ¼ opening on a line with the center of the tee; a piece of 2-in. pipe 6 ft. long; a piece of ¾ pipe. 6 ft. long and one end threaded 3 ins.; one 2-in. cap; one 2-in. by ¾-in. tee; one 2-in. by ¾-in. bushing, and a piece of steam hose about 10 ft. long.

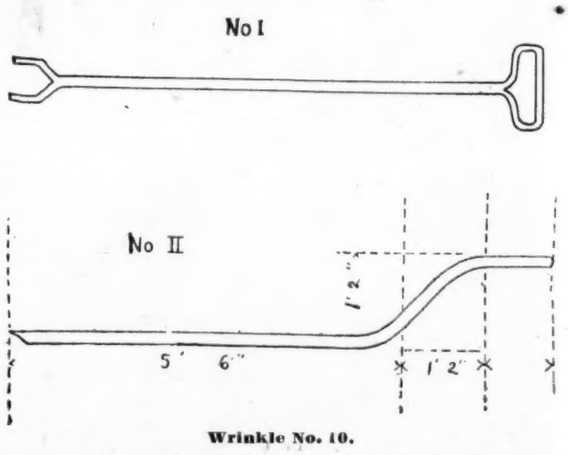

6" PIPE
2" PIPE WITH ENDS SPLIT AND OPENED TO FIT IN SIDE 6" PIPE
SECTION OF BLOWER
2" PIPE
6' 0"
STEAM SUPERHEATER TO BE SET IN FLUE OF BENCH AND CONNECTED TO BLOWER WITH 3 SPIRAL STEEL STEAM HOSE
APPARATUS TO CARBON RETORTS
FRONT VIEW OF BLOWER

Wrinkle No. 9.

Three-quarter inch flexible steel tubing can be bought of Sharp & Klumph, 1104 Monadnock Bldg., Chicago, for 85 cents per ft., and $1.25 each for couplings. This is far superior to steam hose, and will wear indefinitely.

"The steam superheater is connected with about 4½ ft. of its length inside one of the bench flues, and in such a position that the steam hose will reach all the retorts in the bench without breaking the steam connection to the superheater. The 6-in pipe is shoved into the retort to be decarbonized and the prongs of the 2-in. pipe wedged into the 6-in pipe. Steam is now turned on. With 70 pounds steam pressure a very heavy deposit of carbon may be removed in 3 hours, and by using this apparatus a bench of 9 retorts has been carboned in 48 hours, taking one retort at a time, and charging it again before starting on the next retort. The 6-in. pipe will generally last long enough to carbon two benches of nine retorts. Cast iron pipe will not answer."

Wrinkle No. 10. *Tools.*—Mr. C. H. Printz describes two tools of great value in the retort house. No. 1 is for cleaning and holding in place self-sealing lids of retorts while latch is being placed in position.



Wrinkle No. 10.

No. 2 is a sword for breaking clinkers loose from the furnace grate bars. The blade is made of 2½-inch by ¼-inch iron, and the handle of 1¼-inch round iron.

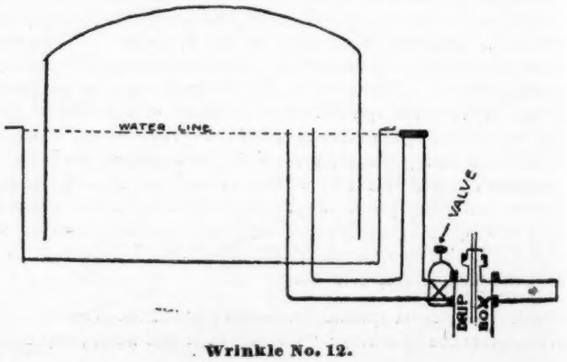
Discussion.

The President—I would like to ask how that second tool works; I don't understand it.

Mr. Eyesenbach—I think it was a special tool for his furnace.

Wrinkle No. 11. *Removing Carbon from Retorts.*—Mr. D. W. Low sends the following: "A 4-inch pipe is connected to the blower of our water gas system, run over in front of the benches, dropping down to the mouth of the retort with a 2-inch pipe, then running about 6 feet into the retort with a ¾-inch pipe. By putting on a medium strong blast, we are able to take all the carbon out of our retorts in about 8 hours."

Wrinkle No. 12. *For Removing Naphthaline Trouble in the Inlet and Outlet Pipes of a Gasholder.*—Described by Mr. M. E. Malone as follows: "It consists of placing 2 tees beyond drips and valves on the horizontal inlet and outlet pipes leading into holder. The side openings on these tees point upwards, and in them are placed 2 vertical pipes at the same height as the inlet and outlet vertical pipes inside the tank, these form a U-shaped arrangement. The outside pipes are capped with a flange or plug. In case of excessive trouble with naphthaline deposits in the inlet and outlet pipes, the valve on the inlet to holder is



Wrinkle No. 12.

closed and the U-shaped pipe filled with water. The cap can be removed from the vertical pipe on the outside of the tank, and a plunger placed in this pipe and the water churned until the naphthaline crystals are deposited in the bottom of the U-shaped pipe. The plunger is removed, the pipe capped up and the valve opened, when all the liquid and naphthaline deposit will fall to the drip, which can be pumped out. The same method can be employed on the outlet pipe. This method, of course, can only be used where there are two holders."

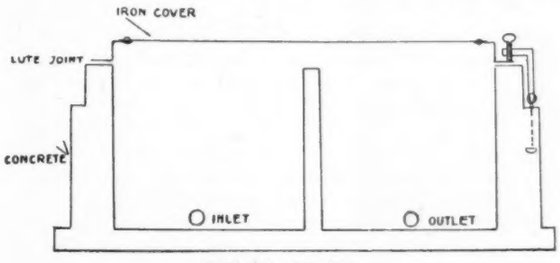
Discussion.

The President—Any comments, gentlemen?

Mr. Whysall—I see no reason why you could not use this with one holder. You have an inlet and an outlet pipe and use a bye-pass and apply this same arrangement in each one.

The President—I think you could.

Wrinkle No. 13. *Purifying Box.*—Mr. C. M. Keller sends the following: "The sketch shown herewith illustrates a purifying box made of Portland cement concrete plastered with a coat of neat cement. The covers are made of Z-bar iron with sheet iron riveted on the top. The joint is made with luting. The top is held down by the screw and



Wrinkle No. 13.

anchored in the concrete. The round ring shown is anchored into the cement and the fastening hooked into it. The boxes are 10 by 12, inside measurement, with a partition in the center. The gas comes in the bottom of one side and goes out the bottom of the other. There are two sets of trays which are held up by framework."

Discussion.

The President—Any comments? This is rather an interesting departure in a purifying box construction.

Mr. Andrews—It seems to me a good deal of money is being spent on the top of that box which possibly could be saved by putting a concrete top over the whole thing and placing manholes sufficient in size to properly ventilate it after being emptied, and then putting openings at the side to rake out your spent oxide. The top has to be pretty strong to carry the upward pressure.

Wrinkle No. 14. *Electric Fan for Increasing Condensation.*—Mr. W. A. Baehr sends the following: "At the gas works of Denver we have a series of vertical annular atmospheric condensers in the coal gas plant. We increased the amount of coal gas made considerably, and as a result found that we were not able to condense properly. As the cheapest and most satisfactory expedient under the circumstances, we adopted the following scheme: At the upper end of each condenser, on the inside of the air space, we placed a circular pipe which was perforated with numerous small openings. Through these we pumped water, so that it would spray against the inside of the vertical tube. This water running down would, of course, help to cool the gas. Under this series of condensers is a tunnel running under the building to the outside. At the outside of the building we erected a 36-inch fan, driving it with a 3-horse power electric motor. By means of this fan the air blast was made to go into the tunnel, and up the inside ring of each condenser, meeting the water spray flowing downwards. This caused considerable evaporation to take place, and we benefited, of course, by the absorption of heat from the gas due to the latent heat of vaporization at that temperature. We were able in this way to pull through the hottest part of the summer, keeping the gas at a temperature of 70° to 72°. Total reduction of temperature of the gas was practically 50 F. The cost of the electric power, using 3-horse power, was practically $250 per year, constant service day and night.

Discussion.

The President—Any comments, gentlemen? I might add something about this by explaining that it was not so much the lack of capacity in our condensing plant as was the fact that no matter how much capacity we had we could not get below atmospheric temperature. We were dependent upon air for condensation, and as our water had to be pumped from a great depth, we concluded it was easier to pump air than water, so we allowed the water to run out on the inside of the condensers and then blow air through them, trying to find a favorite rate of blast. We found when the temperature outside was up in the nineties we could keep the temperature in the room down in the seventies, and the inside of the scrubbers was even less than that, due to the vaporization of the water. The room was as cool as cool could be in the summer.

Wrinkle No. 15. *A Method for Preventing Naphthaline Stoppages by Injecting into the Gas Hydrocarbon Vapor.*—Mr. W. A. Baehr also contributes the following: "We have always found considerable trouble during the fall months from naphthaline. This trouble occurred not so much at the works as it did in the street in the distribution system. We have found the following a very successful plan for getting rid of this trouble. A piece of flanged, 16-in. pipe, about 10 feet long, was fitted with cover plates at each end, and through one end the steam coil was introduced, the exhaust steam passing out at the same end. This coil was set in the bottom of the 16-in. pipe, which was laid horizontally. When using we partly filled this vaporizer with Pintsch hydrocarbon oil or gasoline. The hydrocarbon oil is better than gasoline. We then closed the stop-cock in the inlet pipe for oil, and turned the steam through the steam coil. This, of course, vaporized the contained oil, and by means of pressure gauges we saw that the pressure did not rise too high. When we had obtained about 20 lbs. of vapor pressure we opened the valves, permitting the vapor mixed with the exhaust steam from the steam coil to enter the street main during the hour of maximum consumption. By suitable piping we are also enabled to force this vapor into the inlet or outlet of the holder or into the pipe leading to our district holder or into main feed line. When we noticed naphthaline troubles beginning in the fall, we immediately started our vaporizer every evening about 5 o'clock. One charge lasted about one hour, and the results were always satisfactory."

Discussion.

Mr. Dunbar—What is the advantage of permitting the vapor to reach 20 pounds before turning it into the main?

The President—I think I am the only one who can answer that question, and I guess I cannot, except that I know it is Mr. Baehr's idea, that if he gets pressure in his tank in that way the vapor will travel farther without condensation. It will have great volume, and if it is going to condense it will get farther away, and then if there is any congestion in the immediate neighborhood it would act as a bulldozer.

Mr. Littlehales—Does he let that quantity out very quietly?

The President—I do not know how he works it.

Mr. Eysenbach—I think he does. The idea is to get the gasoline vapor to go out with the gas, and 20 pounds insures its being thoroughly vaporized.

Wrinkle No. 16. *A Shaking Coke Screen.*—also from Mr. Baehr.—"The shaking screen consists of 2 (in this case) screens, inclined about 30° from the horizontal, one above the other. The top screen is 1-inch square mesh, and the lower one ½-inch square mesh. It is intended in the future to place a third screen above these two of 2-inch square mesh size. The top screen will then catch the coarse coke, the second the nut coke, and the lowest screen the pea coke, while the breeze falls through. The screens, being inclined in different directions, cause the coke to roll off into separate piles. All these screens are vibrated to and fro, about 160 times per minute, by a shaft on a crank, which is in turn operated by a system of spur gearing, the final pinion being of steel, machine cut, and direct connected on the shaft of a 3-horse power electric motor. The motor, switch, speed controller and gearing are in a little wood house on one side, but the whole is on the same base timbers. We dump a cart load of breeze on the top screen, and in about 30 seconds this is all screened and sorted. Photos Nos. 1 and 2 show the front end, and No. 3 the rear end of the 'shaker.' In No. 3 the lower end of the bottom screen is shown. Men with shovels take the separate screening away as fast as formed. It is only claimed for this contrivance that it is a cheap and handy outfit, the whole costing less than $500."

Discussion.

The President—I would add to that that if anybody is going to make a shaking screen I advise him to make it out of punched metal rather than meshes. Our screens have not worn out in Denver. We have used them all winter, but I know from experience that a meshed screen wears out much faster than a steel plate punched to the size you want.

Mr. Stone—That is true of every shaking and revolving screen. A revolving screen at our works made of meshes is getting pretty badly worn. I know of another screen placed in works similar to ours, made

of punched metal, and I do not believe we have done as much work with ours as they have with theirs, and it is in good shape yet.

The President—We adopted the shaking screen in Denver because, as the result of observation and experience, I believed it could be constructed cheaper, that it would do more work for a given area of screen, and would require less power to operate it; but we made a meshed screen in Denver instead of a punched plate. If we had not been in a hurry about it we would have used a punched plate, and I would advise anybody else to use a punched plate and not a wire screen.

Wrinkle No. 17. *Complaint Book.*—Mr. C. S. Ritter sends us the following: "A number, say about 25, information slips, copy of which is shown, are bound together in the form of a small book convenient for the vest pocket. These are given to the employees of a company, to be used as a convenient means of noting matters that come to their attention while off duty, and that should be brought to the attention of the company. Some of the things that have been reported in this way are leaks, poor lights, coke scattered on the streets by the company's teamsters, various complaints and orders, etc., all of which should be brought to the company's notice.

DETROIT CITY GAS CO. Form B 178. 10m. 6-27-00.

Information Slip. Date .....190....

Location.....

Name.....

Kind of gas .....

Information.....

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.....

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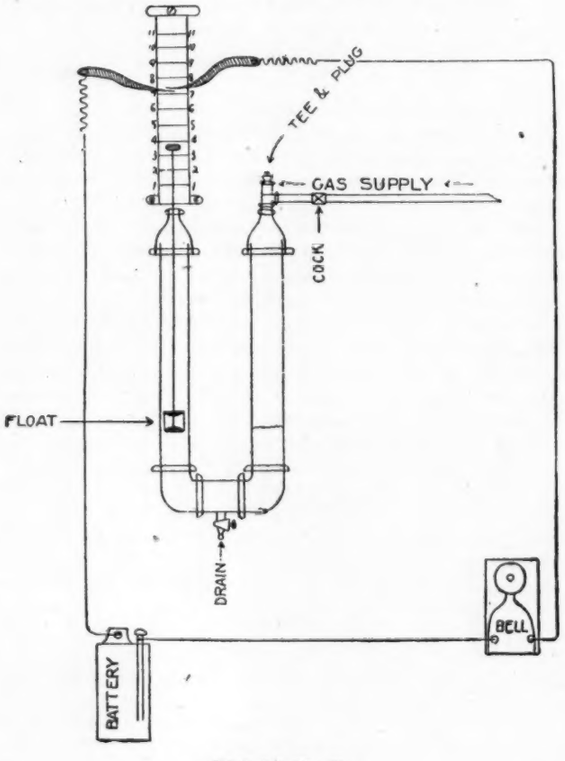
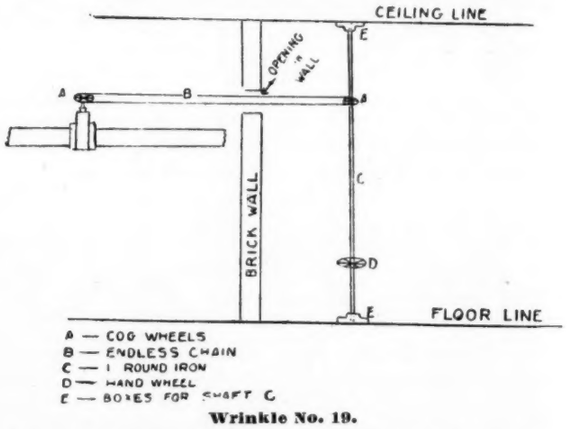
Signed.....

Wrinkle No. 18. *Combination Pressure Gauge and Alarm for Indicating an Extreme Back Pressure.*—Mr. C. A. Schwarm describes this device: "Two brass spring electric contacts are placed at a point indicating an abnormal pressure, and when a choke or stoppage occurs in the works' apparatus the float rises with the liquid in the gauge, forces the two contacts together and rings a bell placed in position so as to be heard by the works foreman or watchman. The device is a cheap pressure gauge, and answers every purpose of the ordinary U-siphon gauge, and when provided with the electric attachment will instantly make an alarm when the back pressure reaches an abnormal point."



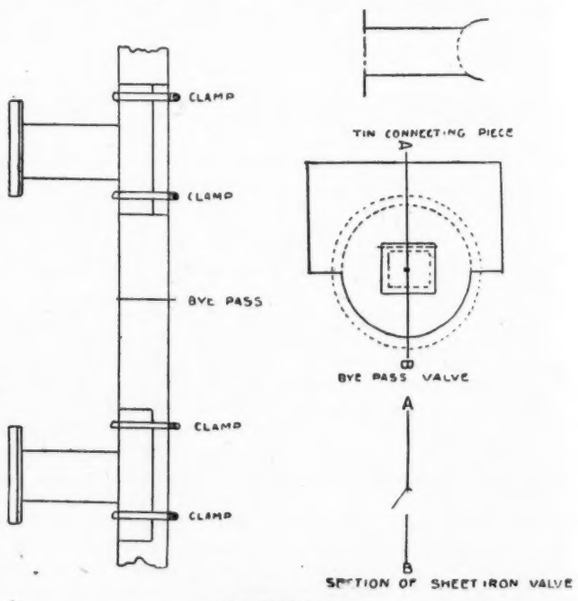
Wrinkle No. 18.

Wrinkle No. 19. *A Convenient Arrangement.*—An arrangement for the convenient handling of a valve, that is frequently used and situated out of reach from the operating floor, is shown by Mr. C. H. Printz, in the accompanying sketch.



Wrinkle No. 19.

Wrinkle No. 20. *A Temporary Connection with Exhauster, made while Works were kept Running.*—Mr. F. W. Stone sends the following: "I was in a town the other day where it had become necessary to place an exhauster in position and still keep the works running. The holder had gotten so low that it was impossible to shut down even for the few hours necessary to make connections to the exhauster. More than this, while the exhauster had arrived, the connections for it had not, and it was absolutely necessary to have the use of the exhauster at once. The main line going through the works was drilled with a number of holes on its side, the holes coming opposite the inlet and outlet pipes of the exhauster, as shown in the sketch. The pipe was 6 inches, and there were seven 1¼-inch holes drilled opposite both the inlet and outlet. Some tin pipes had been made which had one end saddle-

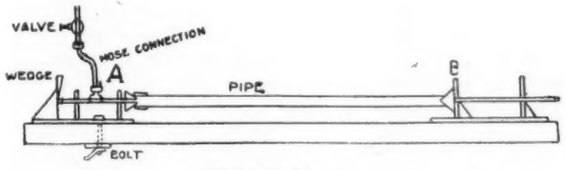


Wrinkle No. 20.

shaped so as to be fitted to the 6-inch main pipe, and the other end was flanged so as to connect to the exhauster. These were attached to the exhauster, the plugs taken out of the holes which had been drilled in the main pipe, and the exhauster shoved back into position. The saddles on the tin pipe were then securely clamped to the main pipe, by means of iron bands. It was now necessary to provide a by-pass valve. This was done in the following manner: Between the inlet and the outlet the main pipe was cut through the upper half of its circumference. A piece of sheet iron had been provided, having another piece in it swung like a swing check-valve. This piece of sheet iron was cut so as to fit closely to the pipe, and was then inserted down through the opening. The swing, of course, was made so as to open when the gas pushed against it, and close when the pressure was the other way. A little soft wax was used to make the sheet iron tight where it projected through the opening in the 6-inch pipe, and an accumulation of tar or pitch on the bottom of the pipe soon made the lower edge of it tight

with the bottom. The exhauster had been running about 3 months in this condition when I last saw it, and was doing first rate work. If the work could not have been done in this manner the works would have had to shut down."

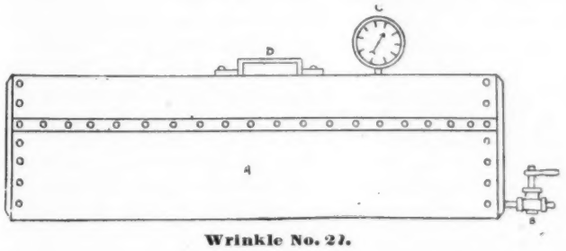
Wrinkle No. 21. Heating Pipes for Coating with Tar or Asphalt.—Mr. F. W. Stone sends description as follows: "End of pipe is placed on cone at *B*, then carriage *A* is run up till cone enters other end, and



Wrinkle No. 21.

fastened with bolt. Wedge is then driven up to make tight and steam is turned on through hose connection. Cones are cast iron; the one at end *A* has hole for passage of steam, both screwed on and supported by pieces of 1¼-inch pipe. Frame is made of 2-inch plank."

Wrinkle No. 22. Pressure Tank for Injecting Alcohol in Thawing Services and Risers.—Mr. Henry W. Douglas sends the following: "Appreciating the desirability of something light and more convenient than the old style, bell service cleaning pump, I had made of galvanized iron a tank 9 inches in diameter and 27 inches long. A nipple was soldered into one side, on which was screwed a small pressure gauge *C*. On the bottom of one end was put a ½-inch lever, handle stop, *B*. A handle *D* was riveted on the top for convenience in carrying. A small amount of alcohol was put in the tank, and pressure of about 20 pounds pumped up by means of a proving pump, service pump, or even a bicycle pump



Wrinkle No. 22.

attached to the stop. The tank is then connected by hose to the service or riser, and with the back end of the tank tipped up the cock is thrown wide open. The alcohol is injected through the pipe in a fine spray. It has been found very convenient where pipes are inaccessible, as the pressure can be put on the tank in a convenient place and then carried to the top of a stepladder, if necessary, for injection."

The President—If there is to be no further discussion on the Wrinkles submitted the Chair will entertain a motion to adjourn.

On motion of Mr. Lathrop the Association adjourned to reconvene at 10 A.M. of the following day.

[To be Continued.]

The Maligned Gas Meter.[1]

"Let us begin," said the man who was once in the gas meter business, but got out of it because he found even his nearest friends regarded him professionally as a cross between a highwayman aud a greengoods dealer; "let us begin by assuming that gas companies are organized for the purpose of robbing an unwary public if they can, and that it is the public's duty and privilege to kick.

"We'll assume that to save trouble. Now then I have some information as to the habits of gas meters and the practice of the companies to impart, which may be useful to the consumer when he steps up to register his kick against the bill."

The man who used to be in the gas meter business bears all the outward semblance of respectability and rectitude of life. It may even be said, now that he has shaken himself free of his former calling, that he looks like a truthful person.

"It is the impression of the average gas consumer," he continued, "not only that he or she, and particularly she, is being robbed by the gas company, but that the company is glad of it, and there is nothing to be done about it but to use such language as the extent of the robbery calls for. The latter part of this impression is usually the result of an interview with a flip ten-dollar clerk. The first part of it, in 999 cases out of 1,000 isn't true, and in the remaining case is due to accident. The State takes care of that.

"Possibly 25 or 30 years ago, when the number of gas consumers was limited and gas was expensive, the companies did get all they could out of the individual consumer without much regard to what he thought about it. New laws have been passed since then and the number of consumers has enormously increased. You may not believe it, but it is true that it pays best now to encourage economical consumption and to increase the uses to which gas may be adapted.

"Now, the gas meter, if it lies, in 9 cases out of 10 lies in favor of the consumer and against the company. I'll tell you why. If you could see the inside of your meter you would find it very much like a bellows. There are several varieties of gas meters, but all are built on the same general plan. The gas enters the meter from one side, passes through the bellows, or collapsible leather bag, and goes into the service pipe on the other side.

"The lung or bellows of the meter swells when the gas passes into it. When it is distended it presses on a rod which connects with a ratchet bearing upon cog wheels which move the indicator on the dial. A certain amount of pressure of the bellows against the rod moves a cog wheel one tooth. That tooth represents one cubic foot of gas passed through the meter.

"The tendency of this mechanism is to register slow rather than fast and for this reason: As the meter grows older the leather dries out and stiffens so that the gas pressure distends it less readily. That doesn't hinder the flow of gas, but only the movement of the indicators, so whenever that occurs the consumer gets more gas then he pays for. Nine meters out of 10 pass more gas than they register. Therefore the company is glad to hear of imperfect meters. This is no dream.

"When the gas bill takes a jump you will usually find a reason for it if you only stop to think about it. Perhaps you have had sickness in your family, or you have been entertaining more than usual. Maybe the servant girl has developed a passion for yellow novels. Only look far enough and you'll find the reason.

"There was a typical case only last summer. A bank president whom almost everybody knows by name went away for several months, closing up his town house. In course of time he received his monthly gas bill as usual. Nobody had been in the house in two months. Then he went to the gas company and denounced the company and its meter in one good comprehensive anathema.

"The company sent an inspector down to the house and the owner went along. He was so sure he had got the company where he wanted it that he was going to see the case through personally. They examined the guilty meter, and a conscienceless thing it looked. Then they went through the house. In the wine cellar, which the banker said he had locked with his own hand before going away, the gas was blazing merrily. He had forgotten to turn it out two months before.

"That was a case of accident. But there are others of crass stupidity. Everybody has a right to kick, as we started by admitting, but sometimes if the kicker would exercise his brain a little he wouldn't exercise his right. A man bought a gas range of me once. The redeeming feature of my connection with the gas business was that I sold ranges instead of meters.

"After he had used his range for two months he came back to see me. He wanted to sell that range for anything he could get—for the price of old iron, even. I asked him if it did good work and he replied that it gave perfect satisfaction in that respect.

"Then what is wrong with it?" I asked him.

"'Well,' he said, 'my gas bills are so infernally high since I got that blessed range that they'll break me if I keep it.'

"'Have you used the gas range much?' I asked him.

"'Yes, continuously,' he said, 'I haven't lighted my coal range at all.'

"'How high is your gas bill this month?'

"'Seven fifty. And before I got this range it was only $5 or near that.'

"'Well, how much coal did you burn before you got the gas range and what did it cost you to put it in your bin?'

"'A ton a month at $6 a ton.'

"'Then,' I said, 'by your own showing you have actually saved $3.50 a month by using gas instead of coal and you're coming back to kick about it.'

1. New York *Sun*.

"He thought that over a minute. Then he said: 'I never thought I was such a damn fool. Good day,' and that was the last I saw of him.

"Now, he belonged to just the type of man that quarrels with the gas company about the meter.

"If folks only knew it, the State watches the gas companies so strictly that they can't play tricks with the gas if they want to. First of all, the law says that a gas meter must register within 2 per cent. of rigid accuracy—that is 2 per cent. above or 2 per cent. below actual consumption. If the difference is greater than that it is illegal to use the meter.

"To see that this is enforced, every meter is inspected constantly. As soon as it is made it is inspected and regulated at the factory. If it is all right, the gas company receives it, but before it can be used it must be inspected by the State.

"Every meter sent out in New York is strictly tested by a State inspector before it is allowed to leave the gas office. If it registers correctly the inspector accepts it and seals it hermetically with the State seal. To tamper with that seal afterward is a felony.

"So it is with a State certificate of efficiency, practically, that the machine goes to the consumer. He can use it for 2 years only. Then it must be tested again. Meantime neither the consumer nor the gas man can get at the recording mechanism inside the cover without disconnecting the thing and taking it back to the shop, or committing felony.

"But that isn't the only way in which the law protects the gas consumer. Suppose the householder suspects that his meter is playing him tricks. He needn't trust the company. All he need do is to notify the gas company that he wants a new test made by a State inspector. The inspector will come, disconnect it, take it away and test it.

"If the kicker is right and the meter does not register correctly the company must pay the inspector 50 cents for making the test. It must also give the consumer a rebate for the approximate amount he has overpaid the company for gas since the meter was officially tested last time. If the meter is correct then the consumer must pay 50 cents for the official intelligence that the mistake is on his side.

"The test is made by attaching to the meter a small gauge the accuracy of which is undoubted and allowing gas to pass through the gauge and meter. If both register the same amount then, of course, the meter is correct. If they don't the difference between them is the sum of the meter's error.

"Tell you of cases in which the consumer has got something out of a gas company? Why, there are lots of 'em. Any company can give you a lot of 'em that'll fill a page of the *Sun*. Ask at the same time for a list of the company's bad debts. I know they amounted to $100,000 and more last year. They were all in small sums, incurred by people moving away and leaving the gas company with just a dollar or two owing to it and nobody to pay. That's why the quarter meters were so enthusiastically adopted by the companies and why they are such a boon.

"Fact is, you may say that the gas company does more for its customers without pay than any other corporation I know of. Yes, sir; now I'm out in the open. The gas company is a much maligned institution, and if I haven't proved it I'd like to know what proof is.

"And one thing more; New York gets gas cheap, and it costs the companies more to manufacture it than it does anywhere else in the country."

All that the oppressed gas consumer whom the reporter sought for an antidote to these remarks had to say about them was this:

"Well, I'd like to see somebody who ever got something for nothing out of a gas company. I'd put him under a glass case and look at him often. He'd be a curiosity, he would.

"Yes, sir; I tried that testing business myself once. My meter wasn't right, so I notified the company and they sent the inspector around. I didn't pay any 50 cents for the meter wasn't all right. But what do you think that inspector reported? He said my meter wasn't working at all. I'd been getting gas for two weeks for nothing. And he fixed it so that if my gas bills kept on running at the rate they are running now I'll be an applicant in bankruptcy proceedings mighty soon."

AT the annual meeting of the Canandaigua (N. Y.) Gas Light Company the following Board of Directors was elected: W. H. Adams, Alex. Grieve, E. O. McNair, W. H. Tenney, W. A. Turnbull, H. B. Ferguson and J. H. Pardee. The Directors subsequently named the following executive management: President, J. H. Pardee; Secretary, H. B. Ferguson.

The Qualifications of a Successful Gas Engineer.

Mr. J. Wentworth, in commenting on the named subject, in the last issue of the *Journal of Gas Lighting* to hand, says:

In the discussions and articles that are now going the round there seems to be a point in the education of a gas engineer that is being overlooked—viz., the practical business and commercial side. In fighting the electric light, it is not the highly scientific man who is coming out on top, but the practical business man, who is quick to grasp the situation and meet energy with energy. It is a trite saying that "dividends are made in the retort house;" but, like other truisms, it is only partly true. It is no use to make a lot of good gas if you cannot get rid of it; and there are probably very few gas works in this country that could not send out more gas if they could sell it. The gas man, instead of spending his time in worrying how to produce an extra 100 cubic feet per ton of coal (important as that may be), could more profitably employ it in trying to sell a few more millions per annum; the other would follow naturally when he had to look round as to how he was going to produce the increase. Then it is no use to sit down and cry out at competition, or wait till the electric light is installed and then say, "Oh! we can give you a better and cheaper light than that;" the better and cheaper light wants to be there first.

One cannot wonder that electric light has got ahead so much, to see the ugly lamps—many of them a long way out of upright—and the miserable light emitted; and if gas people are content to leave things as they are the public will not, and, independently of cost, will naturally go for the more handsome and brilliant light. There is no excuse now for these things, if gas men will be up and doing. They have undoubtedly a better thing to offer; but it must be offered, not wait to be solicited. The gas manager had far better spend his time trying to push his good thing by every available means—soliciting and advertising—than to bemoan his fate and grumble at the advance of his more enterprising rival. This is where the training of our engineers is at fault. Too much is made of scientific and technical training, and not enough of practical and commercial education. Not many years ago, a certain gas company were threatened with serious competition from the electric light. Who was selected to fight it? Not the man who could talk glibly of carbonic acid and sulphuretted hydrogen, but a man who probably had never been inside a gas works in his life—an engineer though of unbounded practical common sense and of good social position. With that result? That company is in a far better position to-day than it probably would have been if a man had been sent imbued with the musty and cast iron traditions of the gas industry.

A man to meet the present competition should have a much more varied and wide experience than can be gained in any gas works, and should be competent to advise on the use of gas both for lighting, heating and power, and not a producer only. How many men, for instance, could take a gas engine apart and explain all its complicated working? It should be part of a man's training to understand the working of all machinery, both inside and outside the works, connected with gas; and only a practical workshop experience can give this. "Never put a man to do what you cannot do yourself" is a maxim worth striving for. The boy now who is to be the future manager, usually hangs about his father's or some relative's works until some place turns up where he has enough influence to get him in. Then one hears the remark: "He will be all right there, he has a good foreman." That is the rub. He often has to depend on his subordinates, and in the case of a breakdown is lost. Men are often put into positions of responsibility too young and without the necessary experience to grapple with passing difficulties. Then comes in the consulting engineer. If every man were competent for his post, where is the need of the consulting gentleman? The fact of so many practicing as such proves the conclusion. What is required in the successful manager is unbounded practical common sense and commercial ability, plenty of push and energy, not one to sit down and await events, but up and doing, determined to make use of the advantages he has and to be first in the field—always remembering that once a system is installed, it takes a lot of ousting—keeping himself well up to date, and a bit before, in all the improvements likely to aid him in not only maintaining his position, but getting one ahead.

The trend of thought requisite to produce a highly scientific mind is not altogether the best training for such qualities. If a man has enough technical skill to enable him to make practical use of the discoveries scientists make, and the qualities in him already stated, he need not fear to take on the full responsibilities of management—knowing he is fully equipped to meet, and overcome, the difficulties he will be sure to encounter without outside aid, and also successfully compete with any rivals.

Australian Coal.

Engineering notes that further information, in the shape of an official report, is now available on the subject of the anthracite coal deposits of Queensland, and another reference may be made to the matter here, as the discovery promises, if not exactly to revolutionize industrial conditions in Australia, at least to be of great significance, and it certainly introduces an element previously lacking for the development of the Colonies. For although everyone possesses coal, the fuel is not of such high steam-making quality as to insure a great trade New South Wales is best off in this matter, and that colony has cultivated widespread connections among the other colonies, and on the west coast of the two Americas, and elsewhere. But the limitations of New South Wales coal are well known. The Queensland anthracite is found in the Dawson and McKenzie River districts, and it is of good augury for the future that the Central Railway, running into the interior from Rockhampton, cuts right through the fields. Mr. Dunston estimates that the area over which, as a result of his surveys, the coal may be expected to extend is 5,000 square miles. Analyses of some samples taken at Jellimbah, on the McKenzie, and at Dawson Island, some 100 miles apart, show a close resemblance of constituents as well as a valuable product. The means of seven samples from Dawson Island gave a fixed carbon value of 78.45, with an ash residue of 4.81; and a single sample from the McKenzie gave 75.32 and 5.79 as the proportions of the same constituents. At Dawson Island the seam is abont 10 feet in thickness. The calorific power is, of course, much greater than that of Newcastle (New South Wales) coal, which ought in the end to be displaced from some of its markets. The Queensland coal deposits at present worked are those of Ipswich, Darling Downs, and the Burrum, where the fuel is not of very high grade. The first named field covers 12,000 square miles, and at present accounts for three-fourths of the output, mainly because it possesses a good port in proximity to the oldest settled portion of the colony. But the Burrum has more coal; Burrum is 15 miles northwest from Maryborough, and there several workable seams, running up to 5 feet thick, crop out on the bank of the river. Extensive beds have also been proved to exist in the central district, the deposits being greater than any of those in the north or south. The coal area of the Dawson alone covers 9,400 square miles of country. At the Callide, 52 miles west of Gladstone, coal of good quality has been worked. In the northern division of the colony coal has been found at several points—at the Little River and Oakey Creek, in the vicinity of Cooktown, at the Bowen River, and many other parts further inland, and at the back of Lloyd's Bay, in the Cape York Peninsula. This colony has not made much progress in the past two years. The output is limited almost entirely to local requirements, which have not been considerable, and the pits are too remote from the coast to enable much to be done in the way of an export trade, especially with the quality inferior to that of New South Wales, whose mines are near the sea.

Coal exports from Newcastle (New South Wales) for the past year reached 3,104,735 tons. There was an increase exhibited in the inter-State trade; while the over-sea exports fell away, especially those to the Pacific slope of North America, in consequence of the increased use of oil in that part and of the competition of British Columbia coal, which can now be brought to the seaboard and south to San Francisco and Portland at less than the cost of landing the New South Wales article in those neighborhoods. Last year's output of the various New South Wales mines reached 5,650,000 tons against 4,706,000 tons in 1899 and 3,203,500 tons in 1898. The mines in New South Wales cover an area of 24,000 square miles. The northern division of this area includes the mines in and around Newcastle (which is the shipping port), the valley of the Hunter, Hexham, East and West Maitland, Greta, and Singleton. The southern division embraces the colleries of the south coast from Mount Kembla, Wollongong, Bulli Slifton, and Helensburg; and the western and southwestern division is formed by the mills about Lithgow, Hartley, Katoomba, Rylstone, Wallerawang, Moss Vale and Mittagong. These names, however, are far from covering the area of the known coal measures, as others have been found as far as Dubbo, 278 miles west of Sydney, while they also extend on the southern coast to Ulladulla, 164 miles south of the metropolis, and thence north to the dividing range. Coal also shows itself from the Clarence River to the Queensland border, and inland on the Liverpool plains to the Dumaresq River, which separates New South Wales from its northern neighbor. New Zealand ranks after New South Wales, and it is satisfactory to note that it, too, is making steady progress, although it will be remembered that last year a Royal Commission gave its coal measures only a relatively short lifetime.

The cost of carriage to market militates against the development of some considerable deposits in Tasmania; for instance, the Cornwall and Mount Nicholas mines and the deposits discovered only a few months back at St. Mary's. Nevertheless the quantity mined shows an increasing tendency. In West Australia, coal has been discovered near Bunbury and at several other points, and systematic exploration is proving the existence of considerable deposits at many places in this colony. In Victoria this industry is making rapid progress, though it promises to be some time before local mines are equal to all the wants of the colony. The most important deposits lie in Gippsland, where there are two fields, supposed by scientists to contain 34,0000,000 tons—enough to meet all the wants of Victoria for half a century, if it can only be marketed.

Plant Depreciation and Works Maintenance.[1]

The fair comparison of the costs of rendering various services, especially artifical lighting, heating, and the supply of power, by public undertakings and private installations is as vexed a question in the United States as in the United Kingdom. There, as here, a public company have to contend against the privately owned plant, which the proprietor believes to be capable of doing the same work at a considerable saving of cost. It is, of course, entirely a question of what is taken into account. When the service is purchased from an outside company, the charge covers everything; whereas, in the case of a private plant, the owner charges himself as little as he pleases, usually only the consumable articles and the wages. Mr. R. P. Bolton has discussed this subject in a paper read before the American Society of Heating and Ventilating Engineers (reported in *Engineering Record*).

He starts with the admission that while comparisons of costs are directly affected by amounts included for interest, maintenance, and depreciation, these amounts are empirical. One evil result of this, it may be noted, is that local authorities commonly take an empirical allowance for one that may safely be neglected altogether. This is, of course, dangerous and absurd: but it passes with the practitioners of hand-to-mouth municipal finance. The capital charges upon any operating plant begin with the interest, and, if redeemable, the sinking fund. The total cost under this head, of course, depends upon the circumstances. Whatever it is, it is not a question for dispute. The cost of maintenance is compounded of several elements, including cost of upkeep, replacement of perishable parts in working, and precautionary measures. Mr. Bolton would charge repairs of accidental damage, or breakage of plant, to the insurance fund, and not to maintenance. Depreciation, according to Mr. Bolton, is a charge which is calculated to represent the gradual deterioration of a plant, resulting in its eventual wearing out. In certain cases, it is assumed also to represent "the superannuation of a plant, or, in other words, its loss of competitive power by reason of the advent of improved appliances." This is the "antiquation" factor, which has been so much discussed: and it is interesting to find this writer taking the general view that both these elements of loss—wearing out and antiquation—"are over-estimated."

He remarks that it is common to see a sweeping limit of 10 or 15 years assigned as the life of an operative plant, on one or the other of these grounds. He objects to this practice, that while the policy of clinging to antiquated and unproductive machinery is not in consonance with modern ideas of profitable operation, and is clearly not to be recommended, "it must be pointed out that it is not an argument against assigning a reasonably long life to any apparatus, that its use may be found sooner or later to be less economical than improved apparatus. Such improved appliances will, if sufficiently economical, justify in their results the entire renewal of the existing plant at an earlier date than assigned to it, and the cost of such extinguishment or partial discontinuance is to be borne by, or to become chargeable against, the results attainable, with the improved plant." Mr. Bolton further lays down the broad principle that new methods may come into existence at any time, and cannot be reckoned with as a fixed element in computing the useful life of any apparatus. This dictum will afford a crumb of comfort to such as have been overwhelmed with the severity of the extremists who would charge working plant, not only with the cost of its own renewal, but also with the prime cost of a better substitute.

And when it is a case of remodelling old appliances, Mr. Bolton holds that a good deal of it will prove to be more durable than some would admit. If laid down within the last quarter of a century, while such property as steam engines, boilers, piping, and pumps may not be quite of the pattern that would be chosen to-day, it does not follow that they

1. *Journal of Gas Lighting*.

are not capable of earning their money. Indeed, where the original investment is returning an ample profit, it is Mr. Bolton's suggestion that the owner is not likely to trouble himself about regular and formal depreciation accounts. If he puts it all back into his business, the theoretical, or assumed, depreciation allowance is really earning a high rate of interest. In such circumstances, therefore, it would be folly to take the calculated amount out, and invest it elsewhere at 4 per cent. or even less. Assuming the capital employed in a business to be earning 10 per cent. all round, and the plant to have a life of 25 years, the depreciation is actually costing only 1½ per cent. on prime cost. It is open to be argued that if an undertaker need not trouble himself with a regular depreciation fund where every penny of the capital he can put into his business earns 10 per cent., he should be all the more careful on the point when his earnings were nearer to the average return for investment, because a concern making 10 per cent. all round can bear works charges for new plant easier than an undertaking which is barely returning change for a shilling.

Although it is evident how important is the question of standing charges in deciding the relative economy (say) of different kinds of machinery and plant to achieve the same end, they are rarely properly applied to the determination of the selection. A certain piece of apparatus is strongly recommended for the sake of its economical working; but if the working cost were to be debited with all the proper charges, the economy might possibly be outweighed and the balance fall on the other side. This is particularly the case in connection with coal handling machinery, stoking appliances and the like, which differ widely in respect of the perishable proportion of working parts to the whole. It is quite possible that a certain working result can be guaranteed and made to look very favorable for one specialty; but if depreciation has to be charged over the whole, instead of a part of the investment, the economical result will appear quite different. It is the same with the very economical high power, steam saving engines which one hears so much about. These possibly fulfil all that is claimed for them, at a considerable capital cost and by dint of much expensive looking after; while a gas engine costing very much less would answer quite as well.

This other dictum of Mr. Bolton's, that an industrial undertaking cannot be expected to make provision for the cost of its own supersession by something better at any moment, is no discovery of his. It is the same principle that underlies the general rule of British gas companies' finance, that their capital is not to be redeemable out of revenue. In other words, those who go into any business for the sake of the profits must be content to bear the ordinary risk of having their trade taken away by a more deserving competitor. They can insure themselves against the accidents of trade, and make provision against the necessity of renewing their trade implements; but beyond that it is nor fair to the public to require provident arrangements to extend, out of selling prices. While admitting this limitation to the operation of a depreciation allowance, it is well to insist once more upon the unfairness to their competitors of those traders who deliberately shirk the obligation to charge themselves with the reasonable and proper expenses of carrying on their business, of which depreciation is one.

Gas companies complain of local authorities for doing this in regard to electric lighting; but gas companies themselves are not always clean handed in the matter of stove and meter making and repairing. They commonly omit to charge these ancillary departments with the capital and administration charges which are unquestionably incurred on their account, even though they may not appear on the surface. Such partiality is not fair to an ordinary trader, who has to bear all these things, besides the risk of having his trade taken from him at any moment. It is perfectly fair, for example, for a gas manager to charge a repair shop with 4 per cent. net interest for the capital it represents, instead of 8 or 10 per cent. that a trader would require; because in each case the charge represents a fact. Nobody in his senses would go into the gas fittings business unless he could make a larger profit out of it than the interest he could derive from a safe investment which would return his living while he was sleeping. Yet, notwithstanding his greater rate of profit, the trader can often do his work at less cost to the community than the uninterested official, because he has a greater incentive to husbandry. If, notwithstanding his strong inducements to clear as big a profit as he can, the trader charges his turnover with such expenses as he is advised for depreciation, and so forth, how greatly must those statutory companies and local authorities err who do nothing of the kind! Somebody must pay it; and that somebody is always, *ex hypothesi*, a person who should not be chargeable with it.

For—and this is clearly a point not to be ignored—one of the facts of depreciation charges is that they must infallibly be paid. There is no avoiding them bythe crude expedient of leaving them out of the revenue account, or making believe that they are covered by something else—say, a loan redemption account. There are some payments that can be shirked in that way—not many; but the manager's salary, and the reasonable salaries of the office clerks are among them. The workmen will have their proper rate of wages; and quite right, too. Also, the merchants' bills must be paid. Depreciation, and the staff, afford the only opportunities for economizing in working expenses; and they are made the fullest possible use of. There is the difference, however, that whereas depreciation is only another name for Nemesis, and cannot be shaken off, the emoluments of the staff are subject to current liquidation.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Mr. Anderson H. Walters, who since 1889 has acted as Secretary and Superintendent of the Consumers Gas Company, of Johnstown, Pa.—he also held similar official relations to the Johnstown Water Company—has severed his connections with both concerns. Mr. Walters entered the employ of these allied corporations in 1880 as office boy, and steadily advanced to practically the complete executive management of interests representing an investment of $1,250,000. Mr. Walters has purchased and will assume entire management of the Johnstown *Daily and Weekly Tribune*, one of the leading inland newspapers of Pennsylvania.

Owing to the change of ownership in the premises 24 to 32 Pine street, New York, which change involves the demolition of the present buildings and the putting up of modern ones on the named site, Captain W. H. White informs us that his permanent business headquarters will after this week be located in 62 Wall street.

Messrs. E. & F. N. Spon have notified us that their publishing rooms have been removed from 12 Cortlandt street, N. Y., to 123 Liberty street, N. Y.

Mr. Henry M. Bennett, President of the Consolidated Gas Company, of Pittsburg, Pa., died at his country home near Farmingdale, N. J., the afternoon of the 12th inst.

The Sherman (Tex.) Gas Light Company has been incorporated by Messrs. E. L. Samuel, T. Lindsey Fitch, D. W. Lindsey and J. R. Ellis. The Company is capitalized in $30,000.

The Rome (N. Y.) Gas, Electric Light and Power Company has filed a certificate stating that its Board of Directors will hereafter number 9 instead of 5.

Mr. J. W. Martin and his associates have applied to the authorities of Pontiac, Mich., for the right to there operate an opposition gas works. The bait held out is dollar gas, and the "concession" that the city may purchase the plant at any time, at an appraised valuation.

Mr. Avery C. Sickles, of New York city, has purchased the franchise and property of the Middletown (Pa.) Gas Light Company, and will put the plant in shape to meet any demands that may hereafter be made upon it. In the reorganization the following officers were chosen: President, A. C. Sickels; Secretary and Treasurer, E. A. Pinkney. As was noted in the Journal heretofore, Mr. Pinkney is General Manager of the Steelton (Pa.) Home Gas Company, which concern is also controlled by Mr. Sickels.

Mr. Henry A. Sage has resigned the Presidency of the St. Lawrence Gas, Electric and Transportation Company, which corporation controls the properties of the Ogdensburgh Gas Company, the Ogdensburgh Power and Light Company and the Ogdensburgh Street Railway Company, all of Ogdensburgh, N. Y.

It is said that the Brice Gas and Electric Company, of Mason City, Ia., proposes to rebuild its plant on an enlarged scale.

The Pittsburg (Pa.) *Dispatch* reports that the Sharpsburg (Pa.) Gas Company, which has supplied the districts of Sharpsburg and Etna, Pa., with artificial gas for several years, has shut down its plant. This action is attributed chiefly to the inroads made upon its business by the competition of natural gas.

Mr. J. Reith, Jr., has resigned the management of the Woodland (Cal.) Gas and Electric Company. His successor is Mr. W. E. Osborne formerly of the Nevada County (Cal.) Gas and Electric Company.

THE authorities of Wichita, Kas., have granted to Messrs. B. V. Gordon and S. W. Wiggs the right to maintain and operate a natural gas plant in that city.

A CORRESPONDENT in Los Angeles, Cal., under date of the 10th inst., forwards the following: "Judge Austin yesterday handed down an opinion, in what is locally known as the Lowe gas case, in which he holds that the ordinance passed by the Los Angeles City Council prohibiting the erection of gas works in certain sections of the city is valid. Quoting from the opinion: 'From the evidence in this case I am clearly of the opinion that, from the very incipency of the action in this matter, not only prior to but following at all times the action of the Board of Fire Commissioners granting the permit and the entering into the contract on the same day, whereby the Valley Gas and Fuel Company contracted and agreed to build for Caroline W. Dobbins gas works and gasholders upon the described premises, and commenced on said November 22d to lay the foundations and do other work necessary in the construction of said gas works, both parties to said contract were under full and complete notice that the city of Los Angeles had not and could not, by the action of the Board of Fire Commissioners, contract away its own governmental functions and duties, and might at any time thereafter enact the legislation involved in the ordinance under consideration.

"'Therefore, under the rules of law applicable to this case, I am of the opinion that no vested rights had at any time accrued which might constitute a valid defense to this charge; but that, on the contrary, the ordinance is constitutional and valid, and applies with full legal force and effect to the acts of the defendant as shown by the evidence herein. The defendant, F. A. Smith [one of the contractor's working agents], is shown by such evidence to have violated the provisions of the ordinance, and therefore is adjudged guilty as charged.' Smith was fined $100, and the case was appealed to the Superior Court."

Engineering declares that experiments show that it is a decidedly dangerous practice to cover incandescent electric lamps with drapery, and particularly to wrap them in cotton wool, especially with colored bulbs. With 16-candle power colored lamps the wool begins to smoke after 10, and even after 5 minutes. It requires only a slight air draft to make the cotton wool burst out in flames, and then the wool collapses. This collapse is accounted for in the following way. The thin glass wall of the bulb softens under the heat of the glowing cotton wool, particularly in the case of lamps covered with a colored varnish. The air pressure crushes the soft glass until it comes in contact with the incandescent filament; the glass then melts and the air rushes in. No explosion ensues when contact between the filament and the bulb is prevented in time; but indentations of the bulb can always be observed when the cotton wool had been glowing. The low candle power lamps seem to fail as readily as those of higher powers. Although in these experiments the cotton wool was purposely pressed tightly against the bulbs and sockets, there is some danger even with light contact, and the accident should not pass unnoticed. In the early days the electric lamp was eulogized because it gave such a brilliant light. We still pay for the light, but illumination has become secondary to decorative effect, and we are too much inclined to regard any kind of decoration as safe for the electric incandescent lamps.

"J. S. T." informs us that the owners of the Bakersfield (Cal.) Gas and Electric Light Company have disposed of a controlling interest therein to a Mr. C. N. Beal, who is presumed to be acting for the Power Development Company. Our correspondent adds: "It is likely there will be little or no change in the operating force, and none at all in the executive management of the Company, Mr. H. A. Jastro continuing as President, Mr. L. P. St. Clair as Vice-President, and H. A. Blodget as Secretary.

THE proprietors of the Vancouver (B. C.) Gas Company have ordered a reduction in the gross selling rate to $2 per 1,000 cubic feet, less 25 cents for prompt payment. The old rates were: Gross, $2.50 per 1,000; net, $2.25. It should have been said that these changes apply only to gas sold for illuminating account, the fuel rates remaining as before: Gross, $1.50; net, $1.35.

A PARTY of speculators, headed by J. A. Bendure, have applied to the authorities of Meridian, Miss., for the right to construct and operate an opposition gas works here. They assert that they will supply gas on illuminating account at $1.75 per 1,000, and for fuel use at $1.50 per 1,000, less 25 per cent. discount for prompt payment; that is, on bills settled within 10 days.

THE committee to whom was referred the matter of the proposed leasing or sale of the City Light Works, of Alexandria, Va., to the Goldsborough syndicate, unanimously reported against the scheme to the City Council. The final paragraph of the report is as follows: "Your committee recommend that the City Council give notice that the works are neither for sale nor lease, and thus once and for all time check attempts which have been so frequently made in late years to get possession of them.

GOVERNOR MURPHY, of New Jersey, has signed the bill passed by the Legislature which provides that any corporation whose charter has expired within the past two years, or may expire in the future, may, by vote of the stockholders at a meeting called for that purpose, extend its coporate existence without limit. It is surmised by some of the New Jersey newspapers that the bill, which though general in its provisions, was framed to suit the needs of the East Newark (N. J.) Gas Company, the charter of which expired last year.

THE Lowe water gas plant recently installed in the works of the Riverside (Cal.) Light and Fuel Company, is in successful operation.

MR. J. C. SLOAN, who has been in charge of the affairs of the Rome (N. Y.) Gas, Electric Light and Power Company since last summer, has been appointed General Superintendent of the plants controlled by Mr. J. T. Lynn and his associates. Mr. Sloan's successor at Rome is Mr. R. A. Fields.

"K.," writing to the JOURNAL from Hudson, N. Y., under date of the 14th inst., in describing the "Gas Appliance Exchange Advertising Parade" recently brought off there, says: "Leading the procession was a 1-horse, top carriage in which was carried the advertising matter that was being distributed by 4 boys, who had to hustle to keep up with the movement. However, their work was greatly facilitated, as nine-tenths of the spectators were out either at their gateways or at the street curbing. The carriage top was up, and on each side of the vehicle was a banner, reading, 'Twentieth Century Methods.' A banner on the back of the carriage carried the inscriptive question, 'Are you with us?' 'The blanket banner on the horse held the admonition, 'Buy a gas range!' The banner on the second horse advised, 'And have it connected free of charge!' While the banner on the third animal read, 'To 13½ cents of gas'—fuel gas being sold here at $1.50 per 1,000 with a discount of 10 per cent. for prompt payment. The second wagon in the line, a covered delivery wagon, carried a drum corps in its interior. The banners on each side of the wagon completely hid the cover, and carried our address, with a request to call and examine the gas ranges, etc. The third 'wagon' in the procession was in reality a 2-horse truck carrying a load of gas ranges. The route of the procession was through all of the principal streets, of course, and I might add that the lanes, highways and byeways of Hudson were not neglected. In fact I am quite sure not a 'sane soul' in our city failed to either see or hear of our little scheme respecting the advertising of the gas appliances that we have for the benefit of all."

THE Rochester (N.Y.) *Democrat-Chronicle* says that "The proprietors of the Consolidated Gas and Electric Light Company, of Batavia, N.Y., have decided to entirely rebuild and refit their plants, so that the latter will be up-to-date in every respect. The expenditure in this direction will be in the neighborhood of $60,000 at the start and it may be increased to $100,000. The matter has been decided upon, subject to a meeting of ratification by the shareholders, which is practically assured." The betterments include additional ground, a new storage holder up to retaining 100,000 cubic feet, new purifiers and likely a station meter. The plant of the electric division of the Company's business will be perfected to the point that will enable it to supply current for any demand continuously.

THERE is little doubt that the scheme for the merging of the gas, electric lighting and street railway properties (mention of the probability of which merging has been noted in the JOURNAL) in Providence, R. I., will be completed this spring.

IT is thought that the Urbana (O.) Light, Heat and Power Company will construct an artificial gas plant within the limits of the named place. There is hardly room in Urbana for such an undertaking, in that it is pretty well supplied on gas account just now.

THE American Gas Specialty Company, to manufacture "gas appliances," has been chartered by Messrs. Charles E. Ummack, Charles C. Buell and David T. Alexander, of Chicago. The concern is capitalized in $10,000.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

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Notification Respecting Advertising.—Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:

New York—American News Co. 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, APRIL 21, 1902.

The Market for Gas Securities.

The general stock market conditions were on the odd order during the week, the skyrocketing concerning the changes in quotations and even "ownership" of a large railroad causing conservative dealers in stable securities to act as lookers-on rather than as active participants. On the whole, however, despite the unruly and erratic market, local gas shares managed to keep well up with former recent values.

Consolidated gas closed to-day (Friday) at virtually the prices quoted for it last Friday. There is a quiet but persistent inquiry for Mutual gas, and we imagine that holders of the few round lots still outstanding could obtain better prices than those quoted. City gas bonds are strong.

Brooklyn Union is keeping close company with its huge neighbor as to quotations. In fact the speculators seemingly adjudge that one is worth as much as the other. There is nothing to chronicle in respect of the approach of amalgamation, but "wise men" say that certain dealings regarding the electric light situation on the east side of the East river are eloquent of the beginning of the end. Peoples, of Chicago, had quite an advance this week, and Baltimore Consolidated has crossed the 71 mark.

Again we say that this stock is a decided purchase. The legislation in Congress over the readjustment of the affairs of the Washington and Georgetown (D. C.) Companies appears to have no chance for failing to become effective.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

APRIL 21.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	224½	225
Central Union, Bonds, 5's.	3,000,000	1,000	110	111½
Equitable Bonds, 6's	1,000,000	1,000	105	
" 1st Con. 5's	2,300,000	1,000	115	118
Metropolitan Bonds	658,000	.	108	112
Mutual	3,500,000	100	320	330
Municipal Bonds	750,000	.	..	
New Amsterdam Gas Co. .. Bonds, 5's	11,000,000	1,000	111½	..
Northern Union, Bonds, 5's.	1,250,000	1,000	106	108
New York and East River.. Bonds 1st 5's	3,500,000	1,000	112	113
" 1st Con. 5's	1,500,000	..	109	111
Richmond Co., S. I.	348,650	50	100	..
" Bonds	100,000	1,000	103	
Standard	5,000,000	100	130	140
Preferred	5,000,000	100	150	160
Bonds, 1st Mortgage, 5's	1,500,000	1,000	114	117
Yonkers	299,650	500	130	
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	224	225
" " Bonds (5's)	15 000,000	1,000	119	119½
Bay State	50,000,000	50	1	1¼
" Income Bonds	2,000,000	1,000	.	75
Binghamton Gas Works...	450,000	100	28	30
" 1st Mtg. 5's	509,000	1,000	93	96
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	10½	11
" " Bonds, 5's	5,250,000	1,000	84	84½
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000		
Central San Francisco	2,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7.650,000	1,000	104	104½
Cincinnati Gas & Elec. Co.	29,500,000	100	102½	102¾
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	108	109
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	60	65
Preferred	3,026,500	100	84	86
Consumers, Jersey City Bonds	600,000	1,000	102	103
Consumers, Toronto	1,700,000	50	218	225
Consolidated, Baltimore	11,000,000	100	71¼	72
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's.	1,000,000	..	..	..
Equitable, 1st 6's.	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	13	14
" Con. Mtg. 5's	380,000	1,000	82	83
Consolidated G. & E. Co.'s., Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co.	4,825,500	50	.	89
" Prior Lien 5's	5,603,000	1,000	99½	100
Detroit Gas Co., 5's	382,000	1,000	70	73
" Inc. 5's	16,000	100	94	94½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	34	38
Fort Wayne	2,000,000	.	.	.
" Bonds	2,000,000	..	58	63
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	102	104
Hartford	750,000	25	245	265
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	75	85
" Bonds, 6's	2 650,000	..	105	108
Jackson Gas Co.	250,000	50	73	75
" 1st Mtg. 5's	290,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100		90
Preferred	2,500,000	100	104	110
Bonds	10,000,000	1,000	..	108½
Lafayette Gas Co., Ind.	1,000,000	100		60
Bonds	1,000,000	1,000	57	62
Louisville	2,570,000	50	110	120
Madison Gas & Elec. Co. " 1st Mtg. 6's	350,000	1,000	107½	109½
" 6 per cent. scrip, due 1910	100,000	25	25	87
Montreal, Canada	2,000,000	100	182	184¾
Newark, N. J., Con. Gas Co	6,000,000	..	..	55
Bonds, 6's	4,600,000	..	..	103
New Haven	1,000,000	25	300	325
Nashville Gas Lt. Co.	1,000,000	100	110	..
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	104	104¼
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	
Rochester Gas & Elec. Co..	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	48	48½
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgage 6's.	650,000	1,000	113	116
Extension, 6's.	600,000	1,000	112½	115
General Mortgage, 5's.	2,465,000	1,000	90½	92
St. Joseph Gas Co. " 1st Mtg. 5's	751,000	1,000	95	96½
Syracuse, N. Y.	1,750,000	100	15	17
Bonds	1,612.000	1,000	95½	97½
Washington, D. C	2,600,000	20	428¾	431¾
First mortgage 6's	600,000	..	..	..
Western, Milwaukee. Bonds, 5's	4,000,000	..	109½	110
Wilmington, Del	600,000	50	232	..

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STOCKHOLDERS' MEETING.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., March 1, 1902.

The Annual Meeting of the Stockholders of the United Gas Improvement Company will be held at the office of the Company, northwest corner of BROAD AND ARCH STS., PHILADELPHIA, on Monday, May 5, 1902, at 12 o'clock, noon, for the purposes of electing a President and six Directors, to serve for the ensuing year, considering and acting upon the subject of a proposed increase in the capital stock of the Company from 450,000 shares, of the par value of $50 each, to 565,000 shares, of the par value of $50 each, and transacting such other business as may properly come before the meeting.

The stock transfer books will be closed from 3 P.M., April 29, until 9 A.M., May 6th.

By order of the Board of Directors,

1396-4-e.o.t LEWIS LILLIE, Secretary.

Position Wanted.

A YOUNG MAN, with 10 years' practical experience in the manufacturing, distribution and office work of both coal and water gas plants, desires position as Superintendent. Locality no object. Address,

"J. W. B.,"
1402-1 Care this Journal.

WANTED,

Position as Superintendent of Gas Plant,

By a man with several years' experience, both coal and water gas. Familiar with details connected with manufacturing, distribution and office work. Best of references. Town in the West preferred.

1400-5 Address, "H.," care this Journal.

WANTED,

Situation as Superintendent of Gas Works,

By a man of 35. Thoroughly familiar with coal and water gas. Twelve years' experience. Has had good success in increasing output and getting business. Can furnish good references. Thoroughly practical and familiar with all branches of the business. Address, "N. V. B."

1399-tf Care this Journal

WANTED,

Position as Manager or Superintendent,

By an energetic man, having had a large experience in the manufacture and distribution of both coal and water gas. Fully competent to supervise all improvements and extensions. A1 references. Address, "W. J. V.,"

1401-3 Care this Journal.

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Street Foremen and Caulkers.

A gas company in the vicinity of New York city would like to employ a few main and service foremen and caulkers. Would prefer men familiar with gasfitting and meter work. Can furnish steady work the year around, at good wages, to the right kind of men.

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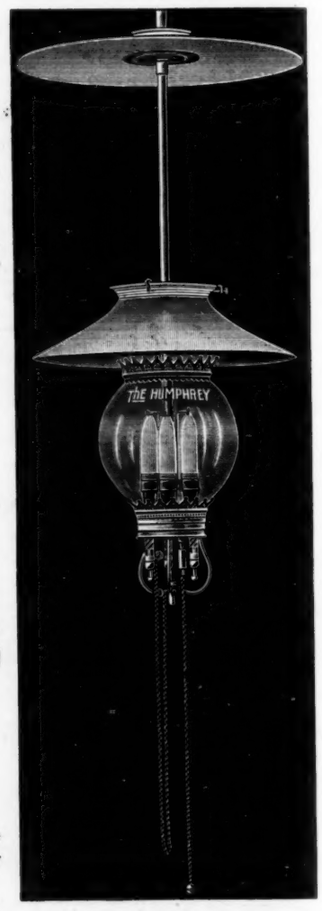

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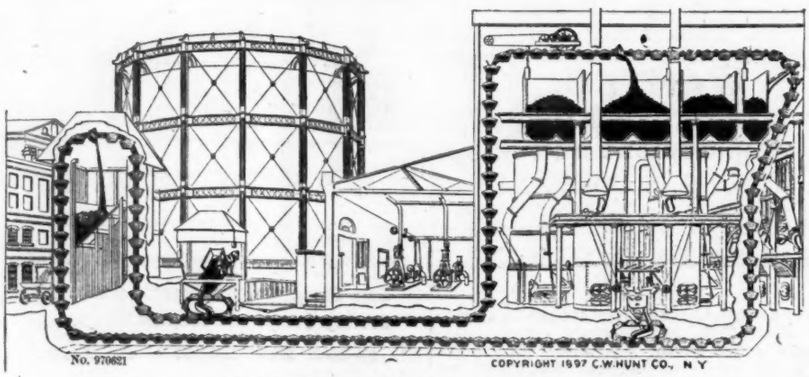

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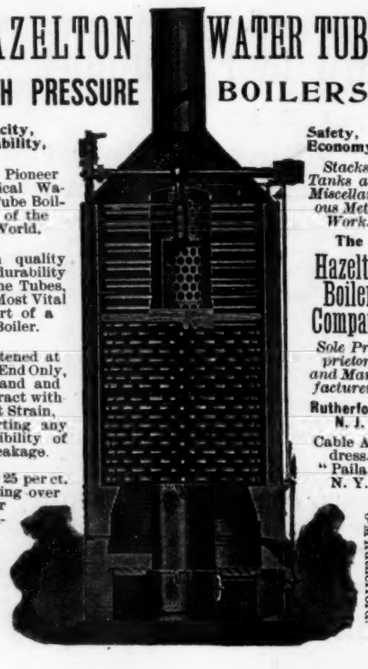

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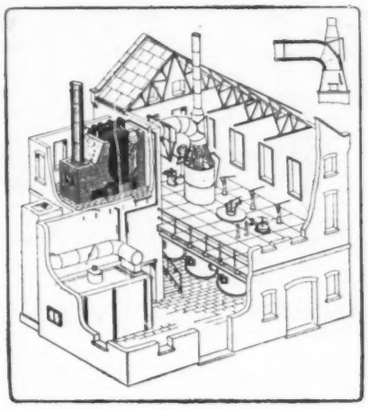

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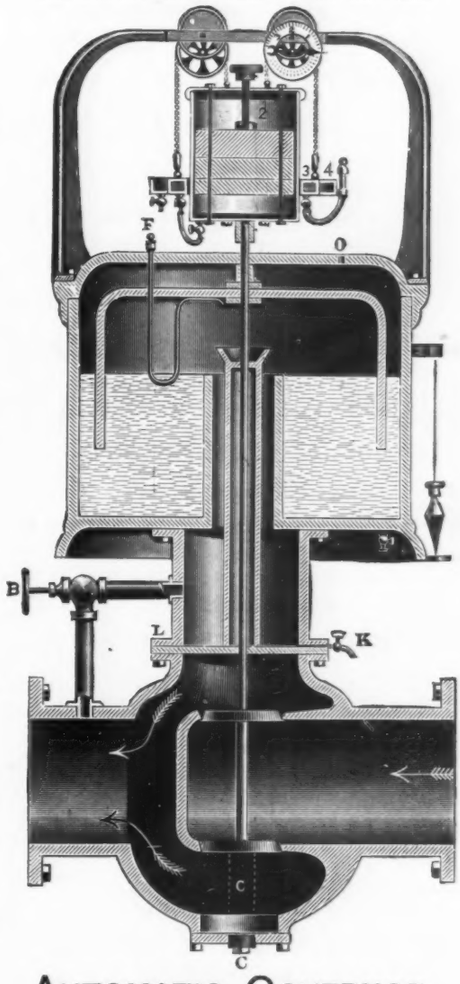

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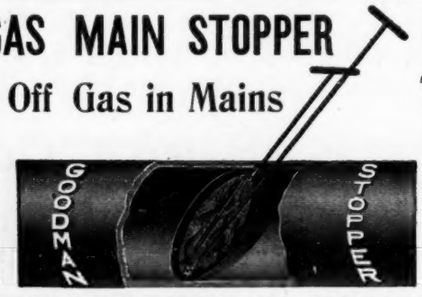

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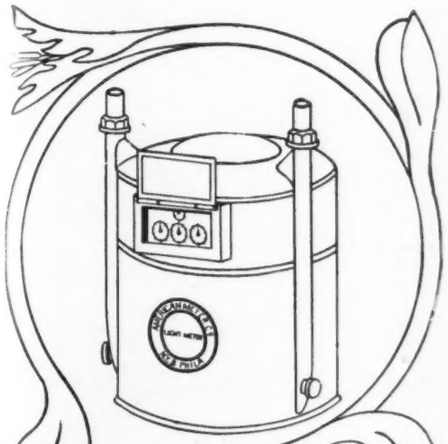

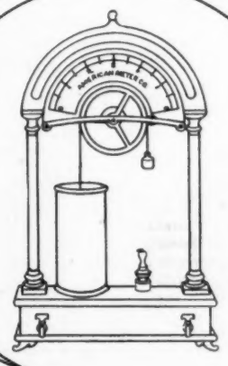

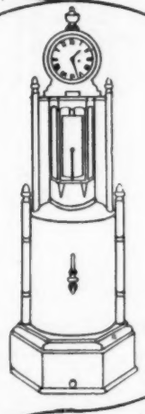

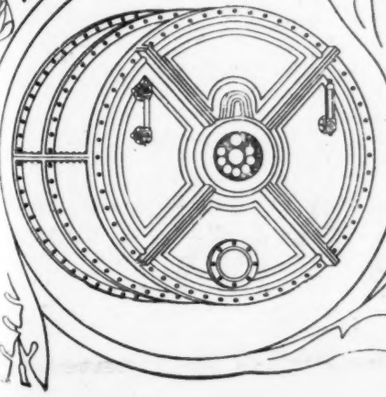

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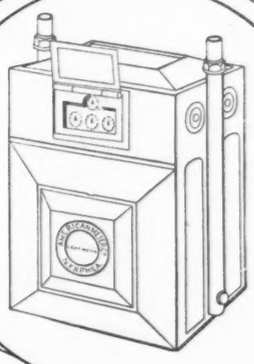

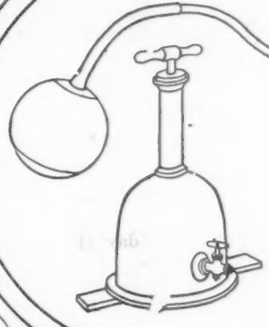

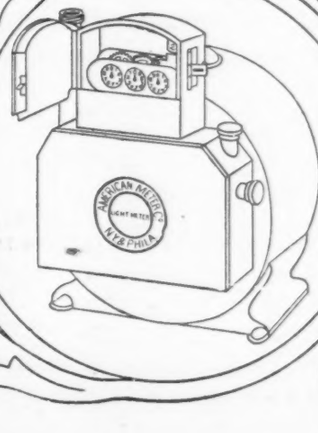

PUBLIC LIGHTING TABLE.

MAY, 1902.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Extinguish.
				P.M.	A.M.
Thu.	1	7.20 PM	2.40 AM	6.45	4.00
Fri.	2	7.20	3.10	6.45	4.00
Sat.	3	7.20	3.40	6.45	4.00
Sun.	4	7.30	3.50	6.45	4.00
Mon.	5	7.30	3.50	6.45	4.00
Tue.	6	7.30	3.50	6.45	4.00
Wed.	7	7.30 NM	3.50	6.55	3.40
Thu.	8	7.30	3.50	6.55	3.40
Fri.	9	7.30	3.50	6.55	3.40
Sat.	10	7.30	3.50	6.55	3.40
Sun.	11	7.30	3.50	6.55	3.40
Mon.	12	10.50	3.50	6.55	3.40
Tue.	13	11.30	3.50	6.55	3.40
Wed.	14	12.00 FQ	3.50	7.00	3.30
Thu.	15	12.30 AM	3.50	7.00	3.30
Fri.	16	1.00	3.50	7.00	3.30
Sat.	17	1.30	3.50	7.00	3.30
Sun.	18	2.10	3.40	7.00	3.30
Mon.	19	2.40	3.40	7.00	3.30
Tue.	20	No L.	No L.	7.00	3.30
Wed.	21	No L. FM	No L.	7.10	3.15
Thu.	22	No L.	No L.	7.10	3.15
Fri.	23	7.40 PM	9.20 PM	7.10	3.15
Sat.	24	7.40	10.10	7.10	3.15
Sun.	25	7.50	10.50	7.10	3.15
Mon.	26	7.50	11.30	7.10	3.15
Tue.	27	7.50	12.00	7.10	3.15
Wed.	28	7.50	12.40 AM	7.15	3.15
Thu.	29	7.50	1.10	7.15	3.15
Fri.	30	7.50 LQ	1.40	7.15	3.15
Sat.	31	7.50	2.10	7.15	3.15

TOTAL HOURS LIGHTING DURING 1902.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	238.30	January	423.20
February	196.20	February	355.25
March	196.20	March	355.35
April	166.40	April	298.50
May	151.40	May	264.50
June	131.10	June	234.25
July	142.40	July	243.45
August	162.00	August	280 25
September	179.00	September	321.15
October	216.30	October	374.30
November	224.10	November	401.40
December	250.00	December	433.45
Total, yr.	2255.00	Total, yr.	3987.45

NEW YORK, 33 Nassau Street. PHILADELPHIA, Broad and Arch Streets. CHICAGO, Foot of Orleans Street. BOSTON, 624 Tremont Building.
CLEVELAND, 809 Cuyahoga Building. ST. LOUIS, 712 Roe Building. SAN FRANCISCO, 712 Polk Street.

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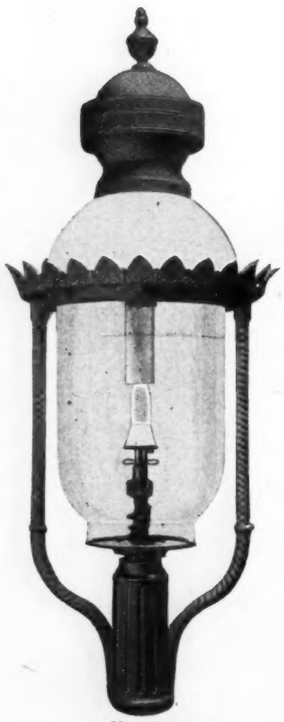
.... OF AMERICA ....



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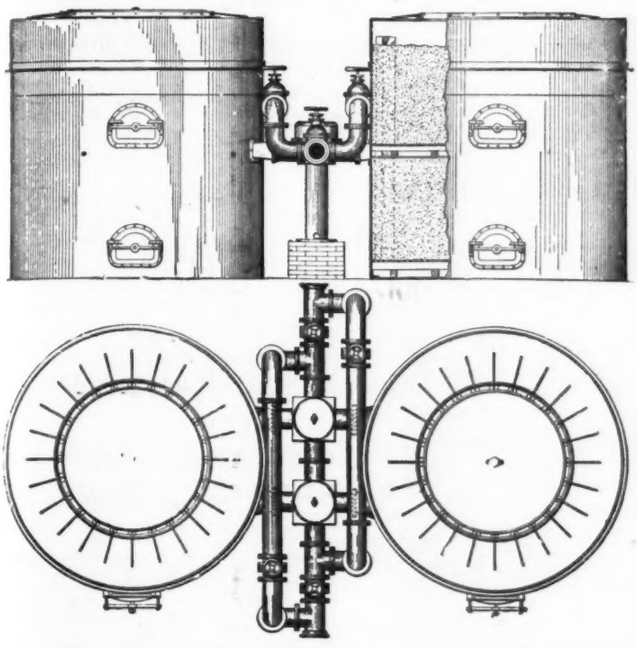

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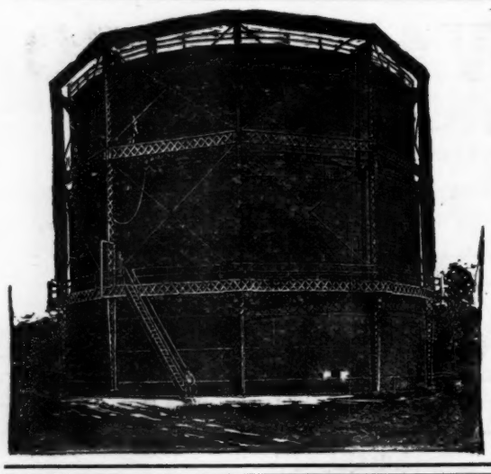

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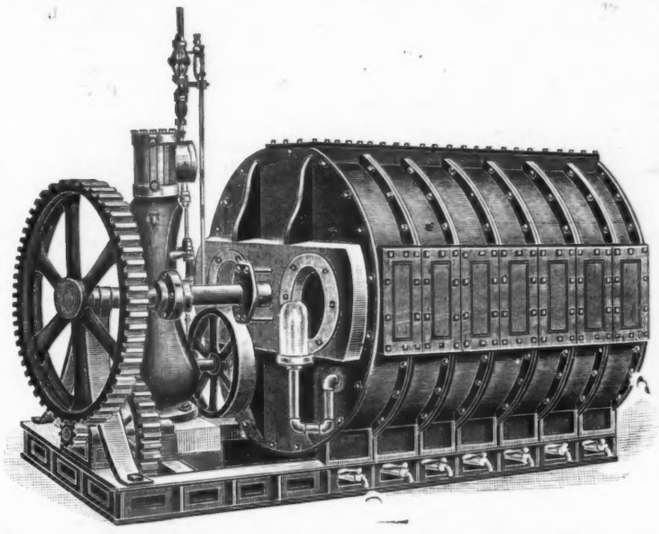

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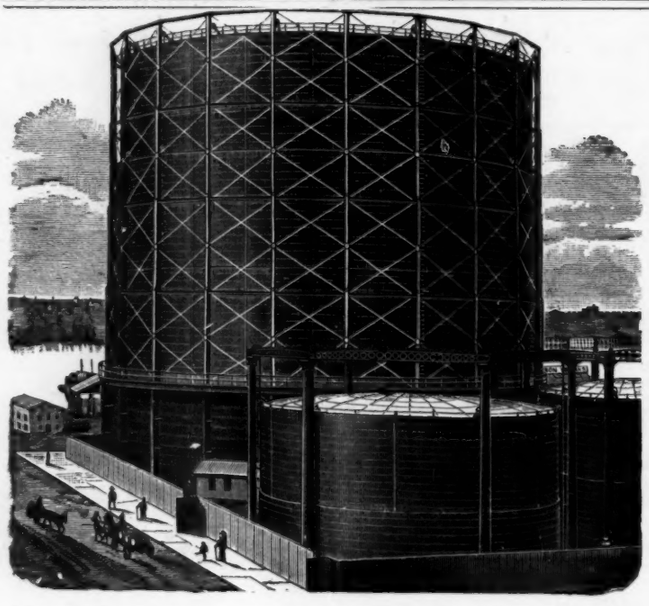

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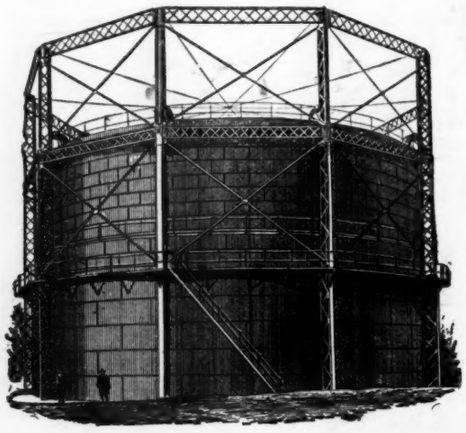

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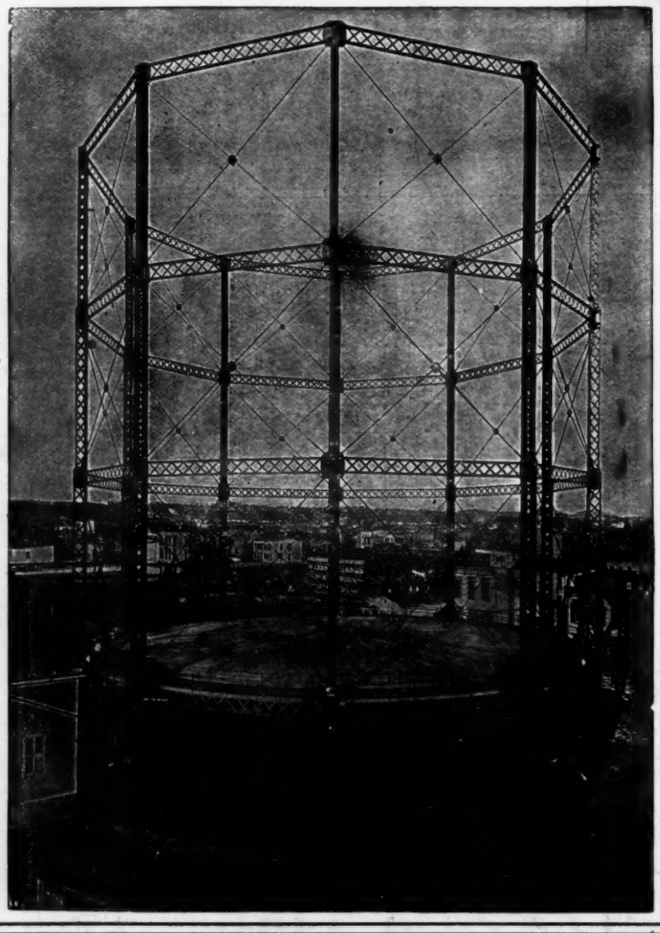

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